Series : QR1SP

SET-4

प्रश्न-पत्र कोड
Q.P. Code 91

रोल नं.
Roll No.

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परीक्षार्थी प्रश्न-पत्र कोड को उत्तर-पुस्तिका के मुख-पृष्ठ पर अवश्य लिखें ।
Candidates must write the Q.P. Code on the title page of the answer-book.

नोट :

(I) कृपया जाँच कर लें कि इस प्रश्न-पत्र में मुद्रित पृष्ठ **32** हैं ।

(II) प्रश्न-पत्र में दाहिने हाथ की ओर दिए गए प्रश्न-पत्र कोड को परीक्षार्थी उत्तर-पुस्तिका के मुख-पृष्ठ पर लिखें ।

(III) कृपया जाँच कर लें कि इस प्रश्न-पत्र में **37** प्रश्न हैं ।

(IV) **कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर-पुस्तिका में यथा स्थान पर प्रश्न का क्रमांक अवश्य लिखें ।**

(V) इस प्रश्न-पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है । प्रश्न-पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा । 10.15 बजे से 10.30 बजे तक परीक्षार्थी केवल प्रश्न-पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर-पुस्तिका पर कोई उत्तर नहीं लिखेंगे ।

NOTE :

(I) Please check that this question paper contains **32** printed pages.

(II) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.

(III) Please check that this question paper contains **37** questions.

(IV) **Please write down the serial number of the question in the answer-book at the given place before attempting it.**

(V) 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period.

कम्प्यूटर साइंस

COMPUTER SCIENCE

निर्धारित समय : 3 घण्टे *अधिकतम अंक : 70*

Time allowed : 3 hours *Maximum Marks : 70*

सामान्य निर्देश :

(i) *इस प्रश्न-पत्र में **37** प्रश्न हैं ।*

(ii) ***सभी** प्रश्न **अनिवार्य** हैं । परंतु कुछ प्रश्नों में आंतरिक विकल्प दिये गये हैं । ऐसे प्रश्नों में केवल एक विकल्प को चुनिए ।*

(iii) *इस प्रश्न-पत्र को **5** खण्डों **क, ख, ग, घ** और **ङ** में बाँटा गया है ।*

(iv) *खण्ड - **क** में **21** प्रश्न (**1** से **21**) हैं । प्रत्येक प्रश्न के लिये **1** अंक निर्धारित है ।*

(v) *खण्ड - **ख** में **7** प्रश्न (**22** से **28**) हैं । प्रत्येक प्रश्न के लिये **2** अंक निर्धारित हैं ।*

(vi) *खण्ड - **ग** में **3** प्रश्न (**29** से **31**) हैं । प्रत्येक प्रश्न के लिये **3** अंक निर्धारित हैं ।*

(vii) *खण्ड - **घ** में **4** प्रश्न (**32** से **35**) हैं । प्रत्येक प्रश्न के लिये **4** अंक निर्धारित हैं ।*

(viii) *खण्ड - **ङ** में **2** प्रश्न (**36** एवं **37**) हैं । प्रत्येक प्रश्न के लिये **5** अंक निर्धारित हैं ।*

(ix) *सभी प्रोग्रामिंग प्रश्नों का उत्तर केवल Python Language में दिया जाना है ।*

(x) *बहुविकल्पीय प्रश्नों (Multiple Choice Questions) के मामले में सही उत्तर का text भी लिखा जाना चाहिए ।*

खण्ड – क (21 × 1 = 21)

1. बतायें कि यह सही (true) है या गलत (false) :

   पाइथन (Python) में `74` का data type `74.0` के data type के समान होता है । **1**

2. निम्नलिखित कोड स्निपिट (Code Snippet) के output को बताइए । **1**

```
s = "the Truth"
print(s.capitalize())
```

   (A) `The truth` (B) `THE TRUTH`

   (C) `The Truth` (D) `the Truth`

3. पाइथन (Python) में निम्नलिखित में से कौन सा एक्सप्रेशन True इवैल्युएट (evaluate) होगा ? **1**

   (A) `2>3 and 2<3` (B) `3>1 and 2`

   (C) `3>1 and 3>2` (D) `3>1 and 3<2`

General Instructions :

(i) *This question paper contains **37** questions.*

(ii) *All questions are **compulsory**. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.*

(iii) *The paper is divided into **5** Sections – **A, B, C, D** and **E**.*

(iv) ***Section A** consists of **21** questions (**1** to **21**). Each question carries **1** mark.*

(v) ***Section B** consists of **7** questions (**22** to **28**). Each question carries **2** marks.*

(vi) ***Section C** consists of **3** questions (**29** to **31**). Each question carries **3** marks.*

(vii) ***Section D** consists of **4** questions (**32** to **35**). Each question carries **4** marks.*

(viii) ***Section E** consists of **2** questions (**36** & **37**). Each question carries **5** marks.*

(ix) *All programming questions are to be answered using Python Language only.*

(x) *In case of MCQs, text of the correct answer should also be written.*

SECTION – A (21 × 1 = 21)

1. State True or False : **1**

   In Python, data type of `74` is same as the data type of `74.0`.

2. Identify the output of the following code snippet : **1**

```
s = "the Truth"
print(s.capitalize())
```

   (A) `The truth` (B) `THE TRUTH`

   (C) `The Truth` (D) `the Truth`

3. Which of the following expressions in Python evaluates to True ? **1**

   (A) `2>3 and 2<3` (B) `3>1 and 2`

   (C) `3>1 and 3>2` (D) `3>1 and 3<2`

4. निम्नलिखित कोड स्निपिट का output क्या है ? 1

```
s='War and Peace by Leo Tolstoy'
print(s.partition("by"))
```

(A) `('War and Peace ', 'by', ' Leo Tolstoy')`

(B) `['War and Peace ', 'by', ' Leo Tolstoy']`

(C) `('War and Peace ', ' Leo Tolstoy')`

(D) `['War and Peace ', ' Leo Tolstoy']`

5. निम्नलिखित statement का output क्या होगा ? 1

```
print("PythonProgram"[-1:2:-2])
```

6. निम्नलिखित कोड स्निपिट का output क्या होगा ? 1

```
t = tuple('tuple')
t2 = t[2],
t += t2
print(t)
```

(A) `('tuple')`

(B) `('tuple','p')`

(C) `('t', 'u', 'p', 'l', 'e', 'p')`

(D) `('t', 'u', 'p', 'l', 'e')`

7. पाइथन में डिक्शनरी (dictionaries) के बारे में निम्नलिखित में से कौन सा कथन सही है ? 1

(A) डिक्शनरी एक अनुक्रम (sequence) डेटाटाइप का उदाहरण है ।

(B) एक डिक्शनरी में दो elements की एक key नहीं हो सकती ।

(C) एक डिक्शनरी में दो elements का मान (value) एक समान नहीं हो सकता ।

(D) किसी element की key और value एक नहीं हो सकते ।

4. What is the output of the following code snippet ? **1**

```
s='War and Peace by Leo Tolstoy'
print(s.partition("by"))
```

(A) `('War and Peace ', 'by', ' Leo Tolstoy')`

(B) `['War and Peace ', 'by', ' Leo Tolstoy']`

(C) `('War and Peace ', ' Leo Tolstoy')`

(D) `['War and Peace ', ' Leo Tolstoy']`

5. What will be the output of the following statement ? **1**

```
print("PythonProgram"[-1:2:-2])
```

6. What will be the output of the following code snippet ? **1**

```
t = tuple('tuple')
t2 = t[2],
t += t2
print(t)
```

(A) `('tuple')`

(B) `('tuple','p')`

(C) `('t', 'u', 'p', 'l', 'e', 'p')`

(D) `('t', 'u', 'p', 'l', 'e')`

7. Which of the following statements is true about dictionaries in Python ? **1**

(A) A dictionary is an example of sequence datatype.

(B) A dictionary cannot have two elements with same key.

(C) A dictionary cannot have two elements with same value.

(D) The key and value of an element cannot be the same.

8. यदि **L** एक लिस्ट (List) है, जिसमें 6 elements हैं, तो निम्नलिखित में कौन सा कथन (statement) exception raise करेगा ? **1**

(A) **L.pop(1)** (B) **L.pop(6)**

(C) **L.insert(1,6)** (D) **L.insert(6,1)**

9. निम्नलिखित कोड का output क्या होगा ? **1**

```
def f1(a,b=1):
    print(a+b,end='-')
c=f1(1,2)
print(c,sep='*')
```

(A) **3-2** (B) **3-2***

(C) **3-None** (D) **3*None-**

10. नीचे दिये गये statement पर विचार कीजिए : **1**

```
f1 = open("pqr.dat","_________")
```

Read only mode में फ़ाइल खोलने के लिये निम्नलिखित में से कौन सही फ़ाइल mode है ?

(A) **a** (B) **rb**

(C) **r+** (D) **rb+**

11. निम्नलिखित statement सही (True) है या गलत (False), बताइए : **1**

पाइथन (Python) में, **try**.....**except**.....**finally** statement का प्रयोग करके logical errors को handle किया जा सकता है ।

12. एक table में दो candidate keys हैं, जिनमें से एक primary key के रूप में चुनी जाती है । इस table में कितनी वैकल्पिक कीज़ (alternate keys) हैं ? **1**

(A) 0 (B) 1

(C) 2 (D) 3

13. निम्नलिखित में से कौन सी SQL कमांड विद्यमान रिलेशन (existing relation) की डिग्री (degree) बदल सकती है ? **1**

(A) **DROP TABLE** (B) **ALTER TABLE**

(C) **UPDATE...SET** (D) **DELETE**

8. If **L** is a list with 6 elements, then which of the following statements will raise an exception ? **1**

(A) **L.pop(1)** (B) **L.pop(6)**

(C) **L.insert(1,6)** (D) **L.insert(6,1)**

9. What will be the output of the following code ? **1**

```
def f1(a,b=1):
    print(a+b,end='-')
c=f1(1,2)
print(c,sep='*')
```

(A) **3-2** (B) **3-2***

(C) **3-None** (D) **3*None-**

10. Consider the statement given below : **1**

```
f1 = open("pqr.dat","_________")
```

Which of the following is the correct file mode to open the file in read only mode ?

(A) **a** (B) **rb**

(C) **r+** (D) **rb+**

11. State whether the following statement is True or False : **1**

In Python, Logical errors can be handled using **try**.....**except**.....**finally** statement.

12. A table has two candidate keys, one of which is chosen as the primary key. How many alternate keys does this table have ? **1**

(A) 0 (B) 1

(C) 2 (D) 3

13. Which of the following SQL command can change the degree of the existing relation ? **1**

(A) **DROP TABLE** (B) **ALTER TABLE**

(C) **UPDATE...SET** (D) **DELETE**

14. इस query का output क्या होगा ? **1**

```
SELECT MACHINE_ID, MACHINE_NAME FROM INVENTORY
    WHERE QUANTITY <= 100;
```

(A) इन्वेंट्री **(INVENTORY)** टेबल (table) के सभी कॉलम जिनकी मात्रा (quantity) 100 से अधिक है ।

(B) इन्वेंट्री **(INVENTORY)** टेबल के 100 से कम मात्रा (quantity) वाली मशीनों की आई डी (ID) और नाम

(C) इन्वेंट्री **(INVENTORY)** टेबल (table) के सभी कॉलम जिनकी मात्रा (quantity) 100 या 100 से अधिक है ।

(D) इन्वेंट्री **(INVENTORY)** टेबल के 100 से कम या इसके बराबर मात्रा वाली मशीनों की आई डी (ID) और नाम

15. MySQL डेटाबेस में एक रिलेशन (relation) में **2** टपल्स (tuples) और **3** अट्रीब्यूट्स (attributes) हैं । यदि **2** Attributes को हटा (delete) दिया जाय और **4** tuples को जोड़ दिया जाय तो रिलेशन (relation) की कार्डिनलिटी (cardinality) क्या होगी ? **1**

(A) 4 (B) 5

(C) 6 (D) 7

16. SQL में, किसी सारणी (table) के कॉलम से कौन सा समुच्चय फलन (aggregate function) सबसे छोटी वैल्यू (smallest value) को रिटर्न (return) करता है ? **1**

(A) **MIN()** (B) **MAX()**

(C) **SMALL()** (D) **LOWER()**

17. Computer Networks के संदर्भ में, निम्नलिखित में से कौन सा RJ 45 का सही विस्तारित रूप है ? **1**

(A) Radio Jockey 45 (B) Registered Jockey 45

(C) Radio Jack 45 (D) Registered Jack 45

14. What will be the output of the query ? **1**

```
SELECT MACHINE_ID, MACHINE_NAME FROM INVENTORY
    WHERE QUANTITY <= 100;
```

(A) All columns of **INVENTORY** table with quantity greater than 100

(B) ID and name of machines with quantity less than 100 from **INVENTORY** table

(C) All columns of **INVENTORY** table with quantity greater than or equal to 100

(D) ID and name of machines with quantity less than or equal to 100 from **INVENTORY** table.

15. A relation in MySQL database consists of **2** tuples and **3** attributes. If **2** attributes are deleted and **4** tuples are added, what will be the cardinality of the relation ? **1**

(A) 4 (B) 5

(C) 6 (D) 7

16. Which aggregate function in SQL returns the smallest value from a column in a table ? **1**

(A) **MIN()** (B) **MAX()**

(C) **SMALL()** (D) **LOWER()**

17. With respect to computer networks, which of the following is the correct expanded form of RJ 45 ? **1**

(A) Radio Jockey 45 (B) Registered Jockey 45

(C) Radio Jack 45 (D) Registered Jack 45

18. कौन सा नेटवर्क डिवाइस (Network device) नेटवर्क के आगम (entry) और निर्गम (exit) प्वाइंट (point) के रूप में कार्य करता है, क्योंकि किसी नेटवर्क में आने और उससे जाने वाले सभी डेटा (data) को सबसे पहले आवागमन मार्ग (routing paths) का प्रयोग करने के लिये इससे होकर गुजरना पड़ता है ? **1**

(A) मॉडेम (Modem)
(B) गेटवे (Gateway)
(C) स्विच (Switch)
(D) रिपीटर (Repeater)

19. XML का पूर्णरूप (full form) क्या है ? **1**

प्रश्न सं. **20** और **21** अभिकथन (Assertion) (A) और तर्क (Reason) (R) आधारित प्रश्न हैं । सही विकल्प पर निम्नलिखित रूप में निशान लगाइये :

(A) अभिकथन (A) और तर्क (R) दोनों सही हैं और अभिकथन (A) का सही स्पष्टीकरण तर्क (R) है ।

(B) अभिकथन (A) और तर्क (R) दोनों सही हैं, और अभिकथन (A) का सही स्पष्टीकरण तर्क (R) नहीं है ।

(C) अभिकथन (A) सही है, परंतु तर्क (R) गलत है ।

(D) अभिकथन (A) गलत है, परंतु तर्क (R) सही है ।

20. **अभिकथन (A)** : `[1,2,3]+'123'` पाइथन में एक अमान्य एक्सप्रेशन (invalid expression) है । **1**

तर्क (R) : पाइथन में लिस्ट (list) को स्ट्रिंग (string) के साथ जोड़ा नहीं जा सकता ।

21. **अभिकथन (A)** : SQL में प्राइमरी (PRIMARY) KEY अवरोध (constraint) यह सुनिश्चित करता है कि कॉलम में प्रत्येक value अलग (unique) हो और **NULL** न हो । **1**

तर्क (R) : कैंडिडेट (Candidate) keys प्राथमिक (Primary) key बनने के योग्य नहीं होतीं ।

18. Which network device serves as the entry and exit point of a network, as all data coming in or going out of a network must first pass through it in order to use routing paths ? **1**

(A) Modem (B) Gateway

(C) Switch (D) Repeater

19. Expand the term XML. **1**

Q. Nos. **20** and **21** are Assertion (A) and Reason (R) based questions. Mark the correct choice as :

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation for Assertion (A).

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

(D) Assertion (A) is false, but Reason (R) is true.

20. **Assertion (A) :** `[1,2,3]+'123'` is an invalid expression in Python. **1**

Reason (R) : In Python, a list cannot be concatenated with a string.

21. **Assertion (A) :** The PRIMARY KEY constraint in SQL ensures that each value in the column(s) is unique and cannot be **`NULL`**. **1**

Reason (R) : Candidate keys are not eligible to become a primary key.

खण्ड – ख (7 × 2 = 14)

22. पाइथन (Python) में डिफॉल्ट पैरामीटर्स (default parameters) और पोज़िशनल पैरामीटर्स (Positional parameters) के बीच क्या अंतर है ? एक फंक्शन हेडर (Function header) का भी उदाहरण दीजिए जो इन दोनों का प्रयोग करता है । **2**

23. निम्नलिखित कार्य करने के लिये एक पाइथन स्टेटमेंट लिखिये : (केवल अंतर्विष्ट (BUILT_IN) फंक्शन (FUNCTION) / मैथड (METHODS) का प्रयोग कीजिए । **2**

(i) लिस्ट (List) **L** को संशोधित किये बिना नई लिस्ट (List) **L1** में आरोही क्रम (ascending order) में लिस्ट (List) **L** के एलीमेंट्स (elements) को व्यवस्थित (arrange) करना ।

(ii) दिया गया अक्षर (character), **ch** एक वर्ण (alphabet) है या एक अंक है यह जाँच करने के लिये एक स्टेटमेंट (statement) देना ।

24. यह मानते हुये कि पाइथन में **D1** एक डिक्शनरी (dictionary) है, **2**

(i) (a) एक पाइथन एक्सप्रैशन (Python expression) लिखिये, यह जाँच करने के लिये कि Key **'RNo'**, **D1** में है या नहीं ।

अथवा

(b) यह जाँच करने के लिये एक Python expression लिखिये कि **D1** की किसी key में value **12** है ।

(ii) (a) **D1** में यदि key **'RNo'** न हो तो key : value pair **'RNo':12** को जोड़ने के लिये अंतर्विष्ट (BUILT_IN) फंक्शन का प्रयोग करते हुए एक अकेला statement लिखिये । यदि key **'RNo'** विद्यमान हो तो function को इसका वैल्यू (value) प्रदर्शित करना चाहिए ।

अथवा

(b) **D1** से सभी elements को हटाने (delete करने) के लिये एक statement लिखिये ।

25. निम्नलिखित कोड (Code) के निष्पादन (execution) पर दिये गये विकल्पों से कौन सा/से संभावित विकल्प प्रदर्शित नहीं होंगे ? यह भी उल्लेख कीजिये कि कितनी पुनरावृत्तियों के लिये code में दिया गया **for** loop चलेगा ? **2**

```
import random
a = [1,2,3,4,5,6]
for i in range(4):
    j = random.randrange(i, 5)
    print{a[j],end='-')
print()
```

Options :

(A) **3-4-5-4-** (B) **2-2-4-5-**

(C) **4-3-3-5-** (D) **5-1-2-4-**

SECTION – B (7 × 2 = 14)

22. What is the difference between default parameters and positional parameters in Python ? Also give an example of a function header which uses both. **2**

23. Write a Python statement to perform the following tasks : (USE BUILT_IN FUNCTIONS / METHODS ONLY) **2**

    (i) To create a new list **L1** containing the elements of list **L** arranged in ascending order, without modifying list **L**.

    (ii) A statement to check whether the given character, **ch** is an alphabet or a number.

24. Assuming that **D1** is a dictionary in Python, **2**

    (i) (a) Write a Python expression to check if the key, **'RNo'** is present in **D1**.

    OR

    (b) Write a Python expression to check if any key in **D1** has a value **12**.

    (ii) (a) Write a single statement using a BUILT_IN function to add the key : value pair **'RNo'** : **12**, if the key **'RNo'**is not present in **D1**. However, if the key **'RNo'** is present, the function should return its value.

    OR

    (b) Write a single statement to delete all the elements from **D1**.

25. What possible output(s) from the given options will NOT be displayed when the following code is executed ? Also, mention, for how many iterations the **for** loop in the given code will run ? **2**

```
import random
a = [1,2,3,4,5,6]
for i in range(4):
    j = random.randrange(i,5)
    print(a[j],end='-')
print()
```

Options :

(A) **3-4-5-4-** (B) **2-2-4-5-**

(C) **4-3-3-5-** (D) **5-1-2-4-**

26. नीचे दिये गये फंक्शन को पैरामीटर के रूप में string **s** को स्वीकार करने और string में दिखाई देने वाले स्वरों (Vowels) की संख्या को रिटर्न (return) करने के लिये लिखा गया है । इस कोड में कुछ त्रुटियाँ हैं । कोड का सावधानीपूर्वक अवलोकन कीजिए और सभी लॉजिकल त्रुटियों (logical errors) और सिन्टेक्स त्रुटियों (Syntax errors) को दूर करने के बाद इसे पुनः लिखिये । किये गये सभी सुधारों को रेखांकित कीजिये । **2**

```
def CountVowels(s):
    c=0
    for ch in range(s):
        if 'aeiouAEIOU' in ch:
            c=+1
    return(ch)
```

27. सुश्री जोया एक फैक्ट्री में उत्पादन प्रबंधक (Production Manager) हैं जो मिनरल वॉटर (mineral water) की पैकेजिंग करती है । फैक्ट्री में उपलब्ध स्टॉक की जानकारी रखने के लिये डेटाबेस में एक सारणी (table) तैयार करने का वह निर्णय लेती है । सारणी के प्रत्येक रिकॉर्ड में निम्नलिखित फील्ड शामिल होंगे : **2**

W_Code – वस्तुओं का कोड (type – **CHAR(5)**)

W_Description – वस्तु का विवरण (type – **VARCHAR(20)**)

B_Qty – वस्तु की बकाया मात्रा (type – **INTEGER**)

U_Price – वस्तु का यूनिट मूल्य (type – **FLOAT**)

सारणी (table) का नाम **W_STOCK** है ।

(i) (a) उपर्युक्त सारणी (table) बनाने के लिये एक SQL command लिखिये ।

(**W_Code** प्राइमरी (primary) key होना चाहिए ।)

अथवा

(b) क्या **U_Price** उपर्युक्त सारणी की प्राइमरी key हो सकती है ? अपने उत्तर का औचित्य बताइये ।

(ii) (a) यह मानते हुये कि table **W_STOCK** पहले से ही बनी हुई है, टेबल में एक एट्रीब्यूट (attribute) **E_Date** (**DATE** type का) जोड़ने के लिये एक SQL command लिखिये ।

अथवा

(b) यह मानते हुये कि table **W_STOCK** पहले से ही बनी हुई है, table से **B_Qty** कॉलम हटाने के लिये एक SQL command लिखिये ।

26. The function given below is written to accept a string **s** as a parameter and return the number of vowels appearing in the string. The code has certain errors. Observe the code carefully and rewrite it after removing all the logical and syntax errors. Underline all the corrections made. **2**

```
def CountVowels(s):
    c=0
    for ch in range(s):
        if 'aeiouAEIOU' in ch:
            c=+1
    return(ch)
```

27. Ms. Zoya is a Production Manager in a factory which packages mineral water. She decides to create a table in a database to keep track of the stock present in the factory. Each record of the table will have the following fields : **2**

W_Code – Code of the item (type – **CHAR(5)**)

W_Description – Description of the item (type – **VARCHAR(20)**)

B_Qty – Balance quantity of the item (type – **INTEGER**)

U_Price – Unit Price of the item (type – **FLOAT**)

The name of the table is **W_STOCK**.

(i) (a) Write an SQL command to create the above table (**W_Code** should be the primary key).

OR

(b) Can **U_Price** be the primary key of the above table ? Justify your answer.

(ii) (a) Assuming that the table **W_STOCK** is already created, write an SQL command to add an attribute **E_Date** (of **DATE** type) to the table.

OR

(b) Assuming that the table **W_STOCK** is already created, write an SQL command to remove the column **B_Qty** from the table.

28. (a) बस टोपोलॉजी (Bus topology) का एक फ़ायदा और एक नुकसान बताइये । **2**

अथवा

(b) कम्प्यूटर नेटवर्क के संदर्भ में प्रोटोकॉल (Protocol) क्या है? वेब पर हाइपरटेक्स्ट को ट्रांसमिट करने के लिये किस Protocol का प्रयोग किया जाता है?

खण्ड – ग **(3 × 3 = 9)**

29. (a) एक पाइथन फंक्शन लिखिये जो **"Space.txt"** नामक text file में उपस्थित अंकों (digits) की संख्या की गणना करता है और उन्हें रिटर्न (return) करता है । उदाहरण के लिये, यदि फ़ाइल में यह सामग्री हो : **3**

```
Space exploration has unlocked incredible
advancements in technology and science. Since the
first moon landing in 1969, space agencies have sent
probes to Mars, Jupiter and beyond. The ISS,
orbiting Earth at about 400 km, serves as a hub for
research. With missions planned for 2030, humanity's
cosmic journey continues!
```

तो फंक्शन को 11 रिटर्न (return) करना चाहिए ।

अथवा

(b) एक पाइथन फंक्शन लिखें जो **Space.txt** नामक टेक्स्ट फाइल से उन शब्दों को प्रदर्शित करता है जिसमें **'e'** अक्षर कम से कम दो बार आते हों । उदाहरण के लिये, यदि फ़ाइल में यह सामग्री हो :

```
Space exploration has unlocked incredible
advancements in technology and science. Since the
first moon landing in 1969, space agencies have sent
probes to Mars, Jupiter and beyond. The ISS,
orbiting Earth at about 400 km, serves as a hub for
research. With missions planned for 2030, humanity's
cosmic journey continues!
```

तो फंक्शन को यह प्रदर्शित करना चाहिए :

```
incredible advancements science. agencies serves
research.
```

28. (a) List one advantage and one disadvantage of Bus topology. **2**

OR

(b) What is protocol in the context of computer networks? Which protocol is used to transmit hypertext across the web?

SECTION – C **(3 × 3 = 9)**

29. (a) Write a Python function that counts and returns the number of digits appearing in the text file **"Space.txt"**. For example, if the file contains : **3**

```
Space exploration has unlocked incredible advancements in technology and science. Since the first moon landing in 1969, space agencies have sent probes to Mars, Jupiter and beyond. The ISS, orbiting Earth at about 400 km, serves as a hub for research. With missions planned for 2030, humanity's cosmic journey continues!
```

Then the function should return 11.

OR

(b) Write a Python function that displays the words in which the lowercase letter **'e'** appears at least twice in the text file **'Space.txt'**. For example, if the file contains :

```
Space exploration has unlocked incredible advancements in technology and science. Since the first moon landing in 1969, space agencies have sent probes to Mars, Jupiter and beyond. The ISS, orbiting Earth at about 400 km, serves as a hub for research. With missions planned for 2030, humanity's cosmic journey continues!
```

Then the function should display :

```
incredible advancements science. agencies serves research.
```

30. (a) **FruitStack** नामक एक stack, जो कि list (लिस्ट) से इम्प्लीमेंट (implement) किया गया है, में कुछ फलों का रिकॉर्ड है । प्रत्येक रिकॉर्ड को '**Name**', '**Origin**', '**Price**' और '**Expiry**' Keys वाली एक dictionary के रूप में दिखाया गया है । एक नमूना रिकॉर्ड यहाँ दिया गया है : **3**

```
{'Name':'Apple','Origin':'France','Price':120,
'Expiry':'12-08-2025'}
```

FruitStack पर विनिर्दिष्ट प्रचालनों (Operations) के निष्पादन के लिये पाइथन में निम्नलिखित यूज़र डिफाइन्ड फंक्शन (User defined functions) को लिखिये :

(i) **push_fruit(FruitStack, Fruit):** यह फंक्शन **FruitStack** स्टैक और एक नये रिकॉर्ड **Fruit** को आर्गुमेंट (argument) के रूप में लेता है और अगर मूल्य **(Price)** 100 से कम है, तो **Fruit** में स्टोर किए गए record को **FruitStack** में पुश (push) करता है ।

(ii) **pop_fruit(FruitStack)**: यह फंक्शन स्टैक (stack) से सर्वोच्च (topmost) रिकॉर्ड को निकाल (pop) कर इसे रिटर्न (return) करता है । यदि stack पहले से ही खाली हो तो फंक्शन को "**UNDERFLOW**" प्रदर्शित करना चाहिए ।

(iii) **display(FruitStack) :** यह फंक्शन सर्वोच्च एलीमेंट (topmost element) से शुरू करके Stack के सभी elements को प्रदर्शित करता है । यदि stack खाली (empty) हो तो फंक्शन को "**EMPTY STACK**" प्रदर्शित करना चाहिए ।

अथवा

(b) User से 10 integers को input करने के लिये एक पाइथन प्रोग्राम लिखिये । यदि User कोई तीन अंकीय सम पूर्णांक (three digit even integer) प्रविष्ट करता है तो इसे stack में डाल दें । सभी इनपुट लेने के बाद, stack से सभी तीन अंको की सम संख्याएँ (three digit even integers) pop करें और उन्हें प्रदर्शित (display) करें । उदाहरण के लिये यदि यूज़र, 12, 31, 320, 457, 6, 92, 924, 220, 1, 218 की प्रविष्टि (entry) करता है तो Stack में यह होना चाहिए :

```
320, 924, 220, 218
```

और प्रोग्राम का output यह होना चाहिए :

```
218 220 924 320
```

31. (a) निम्नलिखित कोड (code) का output लिखिये : **3**

```
def Exam2026(given) :
    new=[]
    for ch in given[1:-1]:
        if ch.isupper():
            new.reverse()
        elif ch not in new:
            new.append(ch)
        elif ch in new:
            new.pop()
    print(new)
Exam2026("Gold-24Medals")
```

अथवा

30. (a) A stack named **FruitStack,** implemented using list, contains records of some fruits. Each record is represented as a dictionary with keys '**Name**', '**Origin**', '**Price**', and '**Expiry**'. A sample record is given here : **3**

```
{'Name':'Apple','Origin':'France','Price':120,
'Expiry':'12-08-2025'}
```

Write the following user-defined functions in Python to perform the specified operations on **FruitStack** :

(i) **push_fruit(FruitStack, Fruit):** This function takes the stack **FruitStack** and a new record **Fruit** as arguments and pushes the record stored in **Fruit** onto **FruitStack** if the **Price** is less than 100.

(ii) **pop_fruit(FruitStack)**: This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display "**UNDERFLOW**".

(iii) **display(FruitStack):** This function displays all the elements of the stack starting from the topmost element. If the stack is empty, the function should display '**EMPTY STACK**'.

OR

(b) Write a Python program to accept 10 integers from the user. If the entered number is a three-digit even integer, push it onto a stack. After all inputs are taken, pop all the three-digit even integers from the stack and display them. For example, if the user enters 12, 31, 320, 457, 6, 92, 924, 220, 1, 218, then the stack should contain :

```
320, 924, 220, 218
```

and the output of the program should be :

```
218 220 924 320
```

31. (a) Write the output of the following code : **3**

```
def Exam2026(given) :
    new=[]
    for ch in given[1:-1]:
        if ch.isupper():
            new.reverse()
        elif ch not in new:
            new.append(ch)
        elif ch in new:
            new.pop()
    print(new)
Exam2026("Gold-24Medals")
```

OR

(b) निम्नलिखित कोड का output लिखिए :

```
def Exam2026(given):
    new = 0
    while given:
        if new % 2:
            new += given % 10
        else:
            new += given % 5
        print(new, end='-')
        given //= 10
Exam2026(123456)
```

खण्ड – घ **(4 × 4 = 16)**

32. अभिषेक ने **STOCK** नाम से एक सारणी (table) तैयार की है जिसमें उसकी दुकान में पैकेट बंद दूध के data रखने के रिकॉर्ड का एक सेट (set) है । Table तैयार करने के बाद उसने आँकड़ों (data) की प्रविष्टि की और table का रूप इस प्रकार बना : **4 × 1 = 4**

Code	Type	Volume	Qty	Price
AF0.5	F	0.5	300	38.00
MF0.5	F	0.5	250	36.50
MT1.0	T	1.0	150	64.00
AT1.0	T	1.0	100	66.00
PD1.0	D	1.0	50	52.00
PT0.5	T	0.5	78	30.00

(a) ऊपर दिये गये data के आधार पर निम्नलिखित कार्यों के लिये SQL queries लिखिये ।

(i) प्रत्येक प्रकार के दूध के लिये उसकी किस्म **(Type)** और अधिकतम मूल्य (Maximum **Price**) दिखाना ।

(ii) प्रत्येक रिकॉर्ड के लिए **Price** को 0.5 बढ़ाना है जहाँ किस्म **(Type) 'F'** है ।

(iii) स्टॉक के कुल मूल्य को प्रदर्शित करना (**Qty** × **Price** का कुल योग)

(iv) उन सभी रिकॉर्ड्स के विस्तृत विवरण दिखाना जहाँ **Code, 'A'** से शुरू होता है ।

अथवा

(b) Write the output of the following code :

```
def Exam2026(given):
    new = 0
    while given:
        if new % 2:
            new += given % 10
        else:
            new += given % 5
        print(new, end='-')
        given //= 10
Exam2026(123456)
```

SECTION – D (4 × 4 = 16)

32. Abhishek has created a table, named **STOCK**, with a set of records to maintain the data of packaged milk in his shop. After creating the table, he entered the data and the table looked as follows : **4 × 1 = 4**

Code	Type	Volume	Qty	Price
AF0.5	F	0.5	300	38.00
MF0.5	F	0.5	250	36.50
MT1.0	T	1.0	150	64.00
AT1.0	T	1.0	100	66.00
PD1.0	D	1.0	50	52.00
PT0.5	T	0.5	78	30.00

(a) Based on the data given above, write the SQL queries for the following tasks :

(i) To display **Type** and the maximum **Price** for each **Type** of milk.

(ii) For each record, increase the **Price** by 0.5 where **Type** is **'F'**.

(iii) To display the total value of the stock (total of **Qty** × **Price**).

(iv) To display the details of all records where **Code** starts with **'A'**.

OR

(b) ऊपर दिये गये table **STOCK** पर विचार करते हुए निम्नलिखित queries के निष्पादन पर output लिखिये :

(i)
```
SELECT Volume, Qty, Price FROM STOCK
    WHERE Type IN ('F','D');
```

(ii)
```
SELECT Code, Qty from STOCK
    WHERE Price BETWEEN 30 AND 50;
```

(iii)
```
SELECT DISTINCT Type FROM STOCK;
```

(iv)
```
SELECT Volume, count(*) FROM STOCK GROUP BY
Volume;
```

33. **"States.csv"** नामक एक csv फ़ाइल में भारत के सभी राज्यों के कुछ आँकड़ें हैं । फ़ाइल के प्रत्येक रिकॉर्ड में निम्नलिखित आँकड़े हैं : **4**

- राज्य का नाम
- राज्य की राजधानी
- राज्य की जनसंख्या
- राज्य की राजभाषा

उदाहरण के लिये फ़ाइल में एक नमूना रिकॉर्ड इस प्रकार है :

['Andhra Pradesh','Amaravati',52221000,'Telugu']

एक Python प्रोग्राम लिखें जो इस फाइल से डेटा पढ़े और उन सभी रिकॉर्डस को, जहाँ जनसंख्या 10000000 से ज्यादा है, एक दूसरी csv फाइल **'More.csv'** में जोड़ दें ।

टिप्पणी : **"States.csv"** में Header row भी है । Header row को **More.csv** में कॉपी नहीं किया जाना चाहिए ।

34. कल्पना कीजिये कि आप एक वित्तीय घराने (Finance House) के ऋण विभाग के प्रबंधक हैं । ऋणों का रिकॉर्ड रखने के लिये आपने दो सारणी (tables) : **CUSTOMERS** और **LOANS** तैयार की हैं । इन tables में नमूना आँकड़ें (sample data) नीचे दिये गये हैं : **4 × 1 = 4**

Table: CUSTOMERS

C_ID	C_Name	Phone
00001	Raj Malhotra	1234567890
00003	David Xavier	3456789012
00004	Damini Iyer	3156789012
00008	Abdul	2345678901



(b) Considering the table **STOCK** as given above, write the output on execution of the following queries :

(i)
```
SELECT Volume, Qty, Price FROM STOCK
    WHERE Type IN ('F','D');
```

(ii)
```
SELECT Code, Qty FROM STOCK
    WHERE Price BETWEEN 30 AND 50;
```

(iii)
```
SELECT DISTINCT Type FROM STOCK;
```

(iv)
```
SELECT Volume, count(*) FROM STOCK GROUP BY
Volume;
```

33. A csv file **"States.csv"** contains some data about all the states of India. Each record of the file contains the following data : **4**

- Name of the State
- Capital of the State
- Population of the State
- Official Language of the State

For example, a sample record in the file is :

```
['Andhra Pradesh','Amaravati',52221000,'Telugu']
```

Write a Python program which reads the data from this file and appends all those records where population is more than 10000000 into another csv file **'More.csv'**.

Note : **"States.csv"** also contains the Header row. The Header row should NOT be copied to **"More.csv"**.

34. Assume that you are the Manager of the Loans department of a Finance House. To keep track of the loans you have created two tables : **CUSTOMERS** and **LOANS**. The sample data in these tables is given below : **4 × 1 = 4**

Table: CUSTOMERS

C_ID	C_Name	Phone
00001	Raj Malhotra	1234567890
00003	David Xavier	3456789012
00004	Damini Iyer	3156789012
00008	Abdul	2345678901

Table: LOANS

SNo	C_ID	L_Amt	L_Date	Terms	RoI
1	00003	200000	2025-12-06	60	7.80
2	00008	2500000	2023-08-09	60	9.00
3	00001	500000	2025-08-13	48	6.00
4	00003	300000	2026-12-07	36	8.00
5	00004	600000	2026-12-07	60	6.00

टिप्पणी : tables में जितने यहाँ दिखाये गये हैं उससे अधिक रिकॉर्ड्स भी हो सकते हैं ।

वित्तीय घराने के प्रबन्धन को आपसे कुछ रिपोर्ट्स की आवश्यकता है । रिपोर्ट्स तैयार करने के लिये निम्नलिखित आँकड़े प्राप्त करने हेतु queries लिखिये :

(i) **LOANS** टेबल से उन रिकॉर्ड्स की संख्या जिनमें ब्याज दर (**RoI**) 7.0 से अधिक है ।

(ii) उन ग्राहकों के नाम जिनके ऋण की धनराशि (**L_Amt**) 1000000 से अधिक है ।

(iii) उन सभी रिकॉर्ड्स की **C_ID**, **C_Name** और **Terms** जिनकी ऋण की तारीख (**L_Date**) 31 दिसम्बर, 2024 के बाद की है ।

(iv) (a) ब्याज दर **(RoI)** के अवरोही क्रम (descending order) में सभी ऋणों का विवरण ।

अथवा

(b) **LOANS** table से प्रत्येक **C_ID** के लिये **C_ID** और औसत अवधि (term) ।

35. पीटर ने MySQL डेटाबेस, **SCHOOL** में **Account** नाम की एक टेबल बनाई है, जिसका स्ट्रक्चर इस प्रकार है : **4**

- **Stud_id – integer**
- **Sname – string**
- **Class – string**
- **Fees – float**

उन छात्रों का रिकॉर्ड दिखाने के लिए उसे एक पाइथन (Python) प्रोग्राम लिखने में मदद करें जिनकी फीस 5000 से कम है ।

पाइथन (Python) और MySQL के बीच कनेक्शन (connection) करने के लिये निम्नलिखित को ध्यान में रखिये :

- Username **– admin**
- Password **– root**
- Host **– localhost**

Table: LOANS

SNo	C_ID	L_Amt	L_Date	Terms	RoI
1	00003	200000	2025-12-06	60	7.80
2	00008	2500000	2023-08-09	60	9.00
3	00001	500000	2025-08-13	48	6.00
4	00003	300000	2026-12-07	36	8.00
5	00004	600000	2026-12-07	60	6.00

Note : The tables may contain more records than shown here.

The management of the Finance House needs certain reports from you. Write the queries to extract the following data to create the reports :

(i) Number of records from **LOANS** table where Rate of Interest (**RoI**) is above 7.0.

(ii) Names of the customers whose loan amount (**L_Amt**) is above 1000000.

(iii) **C_ID**, **C_Name** and **Terms** of all those records where Loan Date (**L_Date**) is after 31st December, 2024.

(iv) (a) Details of all the loans in the descending order of **RoI**.

OR

(b) **C_ID** and average term for each **C_ID** from the **LOANS** table.

35. Peter has created a table named **Account** in MySQL database, **SCHOOL**, having following structure : **4**

- **Stud_id –** integer
- **Sname –** string
- **Class –** string
- **Fees –** float

Help him in writing a Python program to display records of those students whose fees is less than 5000.

Note the following to establish connectivity between Python and MySQL :

- Username **– admin**
- Password **– root**
- Host **– localhost**

खण्ड – ङ **(2 × 5 = 10)**

36. सूचना एवं संचार प्रौद्योगिकी (ICT) से संबंधित विभिन्न विषयों पर प्रशिक्षण कार्यशालायें (Training workshops) आयोजित करने के लिये Next Step एक संगठन है जिसके पास रिसोर्स व्यक्तियों (Resource Persons) का एक समूह है । इसके सभी रिसोर्स पर्सन का डेटा निम्नलिखित रिकॉर्ड स्ट्रक्चर (प्रत्येक रिकॉर्ड एक टपल है) का उपयोग करके **RESOURCES.DAT** नामक बाइनरी (Binary) फाइल में स्टोर किया जाता है । **2 + 3 = 5**

(R_ID, R_Name, R_Expertise, Charges)

जहाँ :

R_ID – रिसोर्स व्यक्ति की आई डी **(Resource Person ID) (An integer)**

R_Name – रिसोर्स व्यक्ति का नाम **(Resource Person Name) (A string)**

R_Expertise – रिसोर्स व्यक्ति की विशेषता का क्षेत्र **(Area of Expertise of the Resource Person)**

Charges – कार्यशाला आयोजित करने के लिये प्रति घंटा शुल्क (रुपये में)

उदाहरण के लिये, फ़ाइल में यह रिकॉर्ड है :

(12, 'P. Velusami','Machine Learning',5000)

इस संदर्भ में निम्नलिखित यूज़र डिफाइन्ड फंक्शन (user defined functions) को पाइथन में लिखिये :

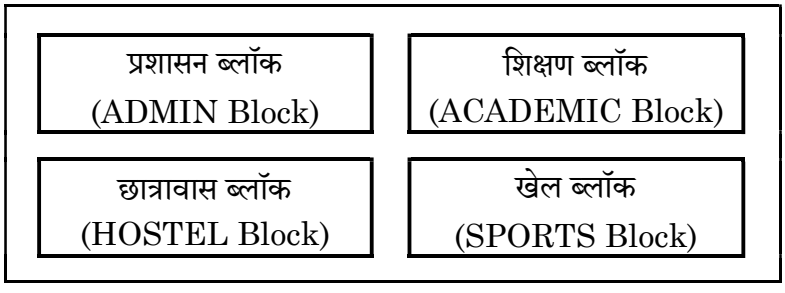
(i) **Append()** – रिसोर्स व्यक्ति का डेटा इनपुट (input) करना और **RESOURCES.DAT** फ़ाइल में लिखना ।

(ii) **Update()** – प्रत्येक रिसोर्स व्यक्ति का शुल्क (**Charges**) 500 बढ़ाना ।

37. संजीवनी, शैक्षणिक संस्थानों का एक बड़ा समूह है जिसका मुख्य कार्यालय (head office) हैदराबाद में है । यह अमृतसर में एक नयी यूनिवर्सिटी बनाने की योजना बना रहा है । अमृतसर विश्वविद्यालय के परिसर में प्रशासन (ADMIN), शिक्षण (ACADEMIC), छात्रावास (HOSTEL), खेल (SPORTS) जैसे चार ब्लॉक/भवन होंगे ।

विभिन्न ब्लॉकों/भवनों के बीच की दूरियों और अन्य दिये गये पैरामीटरों को ध्यान में रखते हुए प्वाइंट (i) से (v) तक में उल्लिखित मुद्दों/समस्याओं को हल करने के लिये आपको एक नेटवर्क–विशेषज्ञ के रूप में उनके लिए नेटवर्क संबंधी सर्वोत्तम समाधानों का सुझाव देने की आवश्यकता है । **5 × 1 = 5**

अमृतसर विश्वविद्यालय परिसर



SECTION – E (2 × 5 = 10)

36. NextStep is an organization which has a pool of resource persons to conduct training workshops on various topics related to ICT. The data of all its Resource Persons is stored in a binary file **RESOURCES.DAT** using the following record structure (each record is a tuple) : **2 + 3 = 5**

```
(R_ID, R_Name, R_Expertise, Charges)
```

where :

R_ID – Resource Person's ID (An integer)

R_Name - Resource Person's Name (A string)

R_Expertise - Area of expertise of the Resource Person

Charges - Charges (in rupees) per hour to conduct a workshop

For example, a record in the file is :

```
(12, 'P. Velusami','Machine Learning',5000)
```

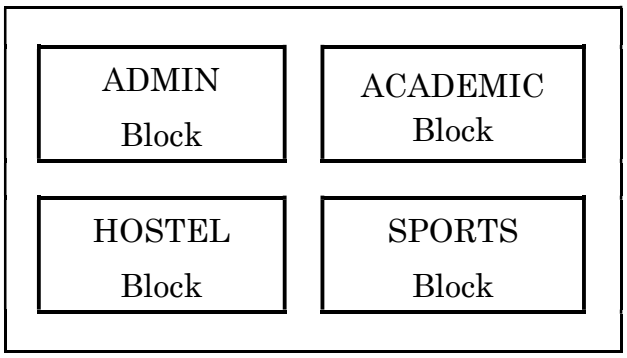
In this context, write the following user defined functions in Python :

(i) **Append()** – To input the data of a Resource Person and write it in the file **RESOURCES.DAT**.

(ii) **Update()** – To increase the **Charges** of each resource person by 500.

37. Sanjeevani is a big group of educational institutions with its head office in Hyderabad. It is planning to set up a new University in Amritsar. The Amritsar University Campus will have four blocks/buildings – ADMIN, ACADEMIC, HOSTEL, SPORTS. You, as a network expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in points (i) to (v), keeping in mind the distances between various blocks / buildings and other given parameters. **5 × 1 = 5**

Amritsar University Campus



Block to Block distances (in Mtrs.)

FROM	TO	DISTANCE
प्रशासन **(ADMIN)**	शिक्षण **(ACADEMIC)**	**60 M**
प्रशासन **(ADMIN)**	छात्रावास **(HOSTEL)**	**160 M**
प्रशासन **(ADMIN)**	खेल **(SPORTS)**	**80 M**
शिक्षण **(ACADEMIC)**	छात्रावास **(HOSTEL)**	**40 M**
शिक्षण **(ACADEMIC)**	खेल **(SPORTS)**	**120 M**
छात्रावास **(HOSTEL)**	खेल **(SPORTS)**	**150 M**

अमृतसर विश्वविद्यालय परिसर से हैदराबाद मुख्य कार्यालय की दूरी = 2000 कि.मी. है ।

प्रत्येक ब्लॉक में कम्प्यूटरों की संख्या इस प्रकार है :

प्रशासन **(ADMIN)**	**25**
शिक्षण **(ACADEMIC)**	**600**
छात्रावास **(HOSTEL)**	**120**
खेल **(SPORTS)**	**50**

(i) अमृतसर विश्वविद्यालय परिसर के अंदर सर्वर (server) के सर्वाधिक उपयुक्त स्थान का सुझाव दीजिये । अपनी पसंद की पुष्टि कीजिए ।

(ii) अमृतसर विश्वविद्यालय परिसर के अंतर्गत विभिन्न ब्लॉकों को कारगर रूप से जोड़ने के लिये cable layout का नक्शा बनाइये ।

(iii) अमृतसर परिसर के अंदर ब्लॉक के विभिन्न कम्प्यूटर्स को जोड़ने के लिये इस्तेमाल किए जा सकने वाले किन्हीं दो वायर्ड मीडिया (wired media) के नाम लिखिए ।

(iv) शैक्षणिक प्रयोजनों के लिये विश्वविद्यालय, परिसर के अंदर चौबीसों घंटे चलने वाला (24 × 7), अपना FM चैनल प्रदान करेगा । FM द्वारा निम्नलिखित में से किस संचार माध्यम (Communication medium) का प्रयोग किया जाता है ?

(A) रेडियो तरंग (Radio Waves)

(B) माइक्रो तरंग (Micro Waves)

(C) इन्फ्रारेड तरंग (Infrared Waves)

Block to Block distances (in Mtrs.)

FROM	TO	DISTANCE
ADMIN	ACADEMIC	60 M
ADMIN	HOSTEL	160 M
ADMIN	SPORTS	80 M
ACADEMIC	HOSTEL	40 M
ACADEMIC	SPORTS	120 M
HOSTEL	SPORTS	150 M

Distance of Hyderabad Head Office from Amritsar University Campus = 2000 km.

Number of computers in each block is as follows :

ADMIN	25
ACADEMIC	600
HOSTEL	120
SPORTS	50

(i) Suggest the most appropriate location of the server inside the Amritsar University Campus. Justify your choice.

(ii) Draw the cable layout to efficiently connect various blocks within the Amritsar University Campus.

(iii) Name any two wired media that can be used to connect various computers of a block inside Amritsar Campus.

(iv) For the academic purpose, the University will provide its own 24 × 7 FM channel within the University Campus. Which communication medium, out of the following, is used by FM ?

(A) Radio Waves

(B) Micro Waves

(C) Infrared Waves

(v) (a) छात्र अनेक ऑनलाइन (online) शैक्षणिक सत्रों और कार्यशालाओं में भाग लेंगे । इसमें श्रव्य-दृश्य संचार (Audio-visual communication) शामिल होगा । उस प्रोटोकॉल (Protocol) का पूरा नाम लिखिये जिसका प्रयोग इंटरनेट के माध्यम से ऐसे संचार के लिये किया जाएगा ।

अथवा

(b) ब्लॉकों के बीच सिगनल (signals) की तीव्रता बढ़ाने के लिये अमृतसर विश्वविद्यालय परिसर में रिपीटर (repeater) कहाँ स्थापित किया जाना चाहिए ? अपने उत्तर का औचित्य दीजिए ।

(v) (a) The students will be attending a lot of online academic sessions and workshops. These will involve audio-visual communication. Write the full name of the protocol which will be used for such a communication through the internet.

OR

(b) Where should a repeater be installed in Amritsar University campus to boost the signal between blocks ? Justify your answer.

———————



Marking Scheme

Strictly Confidential

(For internal and restricted use only)

Senior Secondary School Examination 2026

SUBJECT NAME: COMPUTER SCIENCE SUBJECT CODE: 083 (Set 4 Q.P. CODE 91)

General Instructions:		
1	The CBSE has decided to introduce On Screen Marking (OSM) for the evaluation of Class XII answer Book with the 2026 Examination.	
2	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.	
3	"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, evaluation done and several other aspects. Its leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in Newspaper/Website, etc. may invite action under various rules of the Board and IPC."	
4	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In Class-XII, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.**	
5	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.	
6	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.	
7	Evaluators will mark (√) wherever answer is correct. For wrong answer CROSS 'X' be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**	
8	If a question has parts, please award marks on the right-hand side for each part in the OSM Portal. Marks awarded for different parts of the question will be totaled up by the OSM System.	
9	If a question does not have any parts, marks must be awarded in the left-hand margin in the OSM Portal. This may also be followed strictly.	

10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.	
11	A full scale of marks **70** marks has to be used. Please do not hesitate to award full marks if the answer deserves it.	
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.	
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past :- ● Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) ● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.	
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.	
15	The Examiners should acquaint themselves with the guidelines given in the "**Guidelines for Spot Evaluation**" before starting the actual evaluation.	
16	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.	
17	**If a candidate attempts both alternatives/options in a question where only one option/ alternative is required to be attempted, the Evaluator shall award marks in both the options. The system will take the higher of two scores and disregard the other response.**	
18	**In a question having two options/alternatives, if a candidate has attempted only one, then the evaluator shall mark "NA" (Not attempted) against the option that has not been attempted by the candidate.**	

MARKING SCHEME
COMPUTER SCIENCE 083

Maximum Marks: 70

General Instructions :

(i) *This question paper contains **37** questions.*

(ii) ***All** questions are **compulsory**. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.*

(iii) *The paper is divided into **5** Sections - **A, B, C, D** and **E**.*

(iv) ***Section A** consists of **21** questions (**1** to **21**). Each question carries **1** mark.*

(v) ***Section B** consists of **7** questions (**22** to **28**). Each question carries **2** marks.*

(vi) ***Section C** consists of **3** questions (**29** to **31**). Each question carries **3** marks.*

(vii) ***Section D** consists of **4** questions (**32** to **35**). Each question carries **4** marks.*

(viii) ***Section E** consists of **2** questions (**36** & **37**). Each question carries **5** marks.*

(ix) *All programming questions are to be answered using Python Language only.*

(x) *In case of **MCQs**, text of the correct answer should also be written*

Specific Instructions:

- The answers given in the marking scheme are SUGGESTIVE. Examiners are requested to award marks for all alternative correct Solutions/Answers conveying a similar meaning
- All programming questions have to be answered with respect to Python only
- In Python, ignore case sensitivity for identifiers (Variable / Functions / Structures / Class Names)
- In Python indentation is mandatory, however, the number of spaces used for indenting may vary
- In SQL related questions – both ways of text/character entries should be acceptable for Example: "AMAR" and 'AMAR' both are acceptable.
- In SQL related questions – all date entries should be acceptable for Example: 'YYYY-MM-DD', 'YY-MM-DD', 'DD-Mon-YY', 'DD/MM/YY', "DD/MM/YY", "MM/DD/YY", 'MM/DD/YY' and {MM/DD/YY} are correct.
- In SQL related questions – semicolon should be ignored for terminating the SQL statements
- In SQL related questions – ignore case sensitivity
- In SQL output questions – ignore the column headers
- In SQL output questions – ignore the order of rows until **`ORDER BY`** is specified

SECTION A		**(21x1=21)**
1.	State True or False : In Python, data type of **74** is same as the data type of **74.0.**	1
Ans	**`False`**	
	(1 mark for writing the correct answer)	

2.	Identify the output of the following code snippet :
	`s = "the Truth"`
	`print(s.capitalize())`
	(A) `The truth` (B) `THE TRUTH`
	(C) `The Truth` (D) `the Truth`
		1

Ans	(A) `The truth`	
	(1 Mark for writing the correct option)	
3.	Which of the following expressions in Python evaluates to True ? (A) `2>3 and 2<3` (B) `3>1 and 2` (C) `3>1 and 3>2` (D) `3>1 and 3<2`	1
Ans	(C) `3>1 and 3>2` (B) `3>1 and 2`	
	(1 Mark for writing ANY ONE of the correct option)	

4.	What is the output of the following code snippet ?
	`s='War and Peace by Leo Tolstoy'`
	`print(s.partition("by"))`
	(A) `('War and Peace ', 'by', ' Leo Tolstoy')`
	(B) `['War and Peace ', 'by', ' Leo Tolstoy']`
	(C) `('War and Peace ', ' Leo Tolstoy')`
	(D) `['War and Peace ', ' Leo Tolstoy']`
		1

Ans	**(A)** `('War and Peace ', 'by', ' Leo Tolstoy')`	
	(1 Mark for writing the correct option)	
5.	What will be the output of the following statement ? `print("PythonProgram"[-1:2:-2])`	1
Ans	`mroPo`	
	(½ Mark for writing first character of output correctly i.e. `'m'`***)*** ***(½ Mark for writing remaining characters correctly i.e.*** `'roPo'`***)***	

6.	What will be the output of the following code snippet ?
	`t = tuple('tuple')`
	`t2 = t[2],`
	`t += t2`
	`print(t)`
	(A) `('tuple')`
	(B) `('tuple', 'p')`
	(C) `('t', 'u', 'p', 'l', 'e', 'p')`
	(D) `('t', 'u', 'p', 'l', 'e')`
		1

Ans	(C) `('t', 'u', 'p', 'l', 'e', 'p')`	

	(1 Mark for writing the correct option)	
7.	Which of the following statements is true about dictionaries in Python? (A) A dictionary is an example of sequence datatype. (B) A dictionary cannot have two elements with same key. (C) A dictionary cannot have two elements with same value. (D) The key and value of an element cannot be the same.	1
Ans	(B) A dictionary cannot have two elements with same key.	
	(1 Mark for writing the correct option)	
8.	If **L** is a list with 6 elements, then which of the following statements will raise an exception ? (A) **L.pop(1)** (B) **L.pop(6)** (C) **L.insert(1,6)** (D) **L.insert(6, 1)**	1
Ans	(B) **L.pop(6)**	
	(1 Mark for writing the correct option)	

9.	What will be the output of the following code ?
	`def f1(a,b=1):`
	`  print(a+b,end='-')`
	`c=f1(1,2)`
	`print(c,sep='*')`
	(A) **3-2** (B) **3-2***
	(C) **3-None** (D) **3*None-**
		1

Ans	(C) **3-None**	
	(1 Mark for writing the correct option)	
10.	Consider the statement given below : `f1 = open("pqr.dat", "_____")` Which of the following is the correct file mode to open the file in read only mode ? (A) **a** (B) **rb** (C) **r+** (D) **rb+**	1
Ans	(B) **rb**	
	(1 Mark for writing the correct option)	
11.	State whether the following statement is True or False : In Python, Logical errors can be handled using **try…except…finally** statement.	1
Ans	**False**	

	(1 mark for writing the correct answer)	
12.	A table has two candidate keys, one of which is chosen as the primary key. How many alternate keys does this table have ? (A) **0** (B) **1** (C) **2** (D) **3**	1
Ans	(B) **1**	
	(1 Mark for writing the correct option)	
13.	Which of the following SQL command can change the degree of the existing relation ? (A) **DROP TABLE** (B) **ALTER TABLE** (C) **UPDATE...SET** (D) **DELETE**	1
Ans	(B) **ALTER TABLE**	
	(1 Mark for writing the correct option)	
14.	What will be the output of the query ? `SELECT MACHINE_ID, MACHINE_NAME FROM INVENTORY WHERE QUANTITY <= 100;` (A) All columns of **INVENTORY** table with quantity greater than 100 (B) ID and name of machines with quantity less than 100 from **INVENTORY** table (C) All columns of **INVENTORY** table with quantity greater than or equal to 100 (D) ID and name of machines with quantity less than or equal to 100 from **INVENTORY** table.	1
Ans	(D) ID and name of machines with quantity less than or equal to 100 from **INVENTORY** table.	
	(1 Mark for writing the correct option)	
15.	A relation in MySQL database consists of **2** tuples and **3** attributes. If **2** attributes are deleted and **4** tuples are added, what will be the cardinality of the relation ? (A) **4** (B) **5** (C) **6** (D) **7**	1
Ans	(C) **6**	
	(1 Mark for writing the correct option)	
16.	Which aggregate function in SQL returns the smallest value from a column in a table ? (A) **MIN()** (B) **MAX()**	1

	(C) **`SMALL()`** (D) **`LOWER()`**	
Ans	**(A) `MIN()`**	
	(1 Mark for writing the correct option)	
17.	With respect to computer networks, which of the following is the correct expanded form of RJ 45? (A) Radio Jockey 45 (B) Registered Jockey 45 (C) Radio Jack 45 (D) Registered Jack 45	1
Ans	(D) Registered Jack 45	
	(1 Mark for writing the correct option)	
18.	Which network device serves as the entry and exit point of a network, as all data coming in or going out of a network must first pass through it in order to use routing paths ? (A) Modem (B) Gateway (C) Switch (D) Repeater	1
Ans	(**B**) Gateway	
	(1 Mark for writing the correct option)	
19.	Expand the term XML.	1
Ans	Extensible Markup Language	
	(½ Mark for writing the correct full form of X as eXtensible) ***(½ Mark for writing correct full form of ML as Markup Language)***	
	Q.Nos. **20** and **21** are Assertion (A) and Reason (R) based questions. Mark the correct choice as: (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation for Assertion (A). (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A). (C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.	
20.	**Assertion (A):** `[1,2,3]+'123'` is an invalid expression in Python. **Reason (R):** In Python, a list cannot be concatenated with a string.	1
Ans	(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation for Assertion (A).	
	(1 Mark for writing the correct option)	
21.	**Assertion (A) :** The PRIMARY KEY constraint in SQL ensures that each value in	1

	the column(s) is unique and cannot be **NULL.** **Reason (R) :** Candidate keys are not eligible to become a primary key.	
Ans	(C) Assertion (A) is true, but Reason (R) is false.	
	(1 Mark for writing the correct option)	

	SECTION B	**(7x2=14)**
22.	What is the difference between default parameters and positional parameters in Python ? Also give an example of a function header which uses both.	2

Ans	• Default parameters have default values whereas positional parameters are assigned values to them based on their position in the function call.
	• In a function header, default parameters are always written after positional parameters(if any).
	OR
	Any other valid difference (only one)
	Example :
	`def Q22(X, Y=10): # Here Y is default & X is positional`
	`# parameter`
	OR
	Any other valid example	

	(1 mark for writing any one correct difference) ***(1 mark for writing any one correct example uses both type)*** ***OR*** ***(Full 2 marks for correct explanation with the help of a suitable example)***	
23.	Write a Python statement to perform the following tasks : (USE BUILT_IN FUNCTIONS/METHODS ONLY)	2
	(i) To create a new list **L1** containing the elements of list **L** arranged in ascending order, without modifying list **L**.	

Ans	**(i)** `L1=sorted(L)`
	OR
	`L1=list(L)`
	`L1.sort()`
	OR
	Any other correct option	

	(1 mark for writing the correct statement) ***OR*** ***(½ mark for only mentioning the correct method(s) or function(s))***	
	(ii) A statement to check whether the given character, **ch** is an alphabet or a number.	
Ans	(ii) `ch.isalnum()` **OR**	

	`ch.isdigit() or ch.isalpha()` **OR** Any other method(s) for the required task	
	(1 mark for writing the correct statement with a method/combination of methods) ***OR*** ***(½ mark for only mentioning the method(s) or function(s))***	
24.	Assuming that `D1` is a dictionary in Python,	2
	(i) (a) Write a Python expression to check if the key, `'RNo'` is present in `D1`.	
Ans	(i) (a) `'RNo' in D1` **OR** `'RNo' in D1.keys()`	
	(1 mark for writing the correct statement) ***OR*** ***(½ mark for only mentioning the `'in'` or correct equivalent operator(s))***	
	OR (i) (b) Write a Python expression to check if any key in **D1** has a value **12**.	
Ans	(i) (b) **12 in D1.values()**	
	(1 mark for writing the correct statement) ***OR*** ***(½ mark for only mentioning the `'in'` or correct equivalent operator(s))***	
	(ii) (a) Write a single statement using a BUILT_IN function to add the key : value pair `'RNo':12`, if the key `'RNo'` is not present in `D1`. However, if the key `'RNo'` is present, the function should return its value.	

Ans	(ii) (a) `D1.setdefault('RNo',12)`
	OR
	`if D1.get('RNo'):`
	`  print(D1['RNo'])  # return D1['RNo']`
	`else:`
	`  D1['RNo']=12`
	OR
	Any other correct equivalent statement	

	(1 mark for writing the correct statement) ***OR*** ***(½ mark for mentioning setdefault/equivalent command/statement)***	
	OR (ii) (b) Write a single statement to delete all the elements from `D1`.	

Ans	(ii) (b) `D1.clear()`
	OR
	`D1={}`
	OR
	`D1=dict()`	

	(1 mark for writing the correct statement) ***OR*** ***(½ mark for mentioning the method or function)***	

25.	What possible output(s) from the given options will NOT be displayed when the following code is executed ? Also, mention, for how many iterations the **`for`** loop in the given code will run ?
	
	`import random`
	`a = [1,2,3,4,5,6]`
	`for i in range(4):`
	`  j=random.randrange(i,5)`
	`  print(a[j],end='-')`
	`print( )`
	Options :
	(A) `3-4-5-4-` (B) `2-2-4-5-`
	(C) `4-3-3-5-` (D) `5-1-2-4-`
		2

Ans	(D) `5-1-2-4-` The for loop will run for **`4`** iterations.	
	(1 mark for writing <u>each</u> correct answer)	

26.	The function given below is written to accept a string **`s`** as a parameter and return the number of vowels appearing in the string. The code has certain errors. Observe the code carefully and rewrite it after removing all the logical and syntax errors. Underline all the corrections made.
	`def CountVowels(s):`
	`  c=0`
	`  for ch in range(s):`
	`  if 'aeiouAEIOU' in ch:`
	`  c=+1`
	`  return(ch)`
		2

Ans	`def CountVowels(s):`
	`  c=0`
	`  for ch in s:` `#Correction-1`
	`  if ch in 'aeiouAEIOU':` `#Correction-2`
	`  c+=1 #OR c=c+1` `#Correction-3`
	`  return(c)` `#Correction-4`
	OR
	
	`def CountVowels(s):`
	`  c=0`	

	`for ch in range(len(s)):` #Correction-1 `  if s[ch] in 'aeiouAEIOU':` #Correction-2 `  c=c+1` #Correction-3 `return c` #Correction-4	
	(½ mark for each correction) ***OR*** ***(Full 2 mark for writing the corrected code)*** ***OR*** ***(Total 1 mark for identification of all/any three errors without correction)***	
27.	Ms. Zoya is a Production Manager in a factory which packages mineral water. She decides to create a table in a database to keep track of the stock present in the factory. Each record of the table will have the following fields : **W_Code** – Code of the item (type – **CHAR (5)**) **W_Description** – Description of the item (type – **VARCHAR (20)**) **B_Qty** – Balance quantity of the item (type – **INTEGER**) **U_Price** – Unit Price of the item (type – **FLOAT**) The name of the table is **W_STOCK**.	2
	(i) (a) Write an SQL command to create the above table (**W_Code** should be the primary key).	

Ans	(i) (a)
	`CREATE TABLE W_STOCK`
	`(W_Code CHAR(5) PRIMARY KEY,`
	`W_Description VARCHAR (20),`
	`B_Qty INTEGER, #OR B_Qty INT/B_Qty DECIMAL(4)`
	`U_Price FLOAT);#OR U_Price FLOAT(7,2)`
	`#OR U_Price DECIMAL(7,2)`
	OR
	Any other correct answer	

	(½ mark for correct command `CREATE TABLE`) ***(½ mark for correctly mentioning all the columns and their respective attributes)***	
	OR (i) (b) Can **U_Price** be the primary key of the above table? Justify your answer.	
Ans	(i) (b) No, **U_Price** cannot be the primary key because it may contain duplicate and Null values.	
	(½ mark for writing 'No') ***(½ mark for correct justification)***	
	(ii) (a) Assuming that the table **W_STOCK** is already created, write an SQL command to add an attribute **E_Date** (of **DATE** type) to the table.	

Ans	(ii) (a)
	`ALTER TABLE W_STOCK ADD COLUMN E_Date DATE;`
	OR
	`ALTER TABLE W_STOCK ADD E_Date DATE;`	

	*(½ mark for correct command **ALTER TABLE**)* *(½ mark for correctly adding column using **ADD**)*	
	OR (ii) (b) Assuming that the table **W_STOCK** is already created, write an SQL command to remove the column **B_Qty** from the table.	
Ans	(ii) (b) **ALTER TABLE W_STOCK DROP COLUMN B_Qty;** **OR** **ALTER TABLE W_STOCK DROP B_Qty;**	
	*(½ mark for correct command **ALTER TABLE**)* *(½ mark for correctly deleting column using **DROP**)*	
28.	(a) List one advantage and one disadvantage of Bus topology.	2
Ans	(a) **Advantages :** ● Cost-effective: As it requires less cable. ● Easy to install ● Easy to extend for small networks. **Disadvantages :** ● Failure of the main backbone brings down the entire network. ● Fault isolation is difficult. ● Not suitable for large networks ● Data collisions are frequent when many devices are connected. ● Network speed slows down with heavy traffic. ● Security is low as all devices can access transmitted data.	
	(1 mark for writing any one correct advantage) *(1 mark for writing any one correct disadvantage)*	
	OR (b) What is protocol in the context of computer networks? Which protocol is used to transmit hypertext across the web?	
Ans	(b) A protocol is a set of rules that need to be followed by the communicating devices in order to have successful and reliable data communication. The protocol used to transmit hypertext across the web is **Hypertext Transfer Protocol (HTTP)**	
	(1 mark for correctly defining protocol) *(1 mark for writing Hypertext Transfer Protocol or HTTP or HTTPS, any one)*	

SECTION C		**(3x3=9)**
29.	(a) Write a Python function that counts and returns the number of digits appearing in the text file "**Space.txt**". For example, if the file contains :	3

	Space exploration has unlocked incredible advancements in technology and science. Since the first moon landing in 1969, space agencies have sent probes to Mars, Jupiter and beyond. The ISS, orbiting Earth at about 400 km, serves as a hub for research. With missions planned for 2030, humanity's cosmic journey continues! Then the function should return 11.	
Ans	(a) **def CountDigits():** ** with open("Space.txt",'r') as F:** ** Data=F.read()** ** C=0** ** for CH in Data:** ** if CH.isdigit(): # OR if CH in '0123456789'** ** C+=1 # OR if CH >= '0' and CH <= '9'** ** return C** **OR** **def CountDigits():** ** F = open("Space.txt")** ** All=F.readlines()** ** C=0** ** for Line in All:** ** for CH in Line:** ** if CH.isdigit(): # OR if CH in '0123456789'** ** C+=1 # OR if CH >= '0' and CH <= '9'** ** F.close()** **OR** **Any other equivalent correct code**	
	(½ mark for opening the file in default/correct mode) ***(½ mark for correct reading or similar operation)*** ***(½ mark for correct iteration)*** ***(½ mark for correctly checking the condition)*** ***(½ mark for initializing and incrementing the counter correctly)*** ***(½ mark for returning the count)***	
	OR	
	(b) Write a Python function that displays the words in which the lowercase letter **'e'** appears at least twice in the text file **'Space.txt'**. For example, if the file contains : **Space exploration has unlocked incredible advancements in technology and science. Since the first moon landing in 1969, space agencies have sent probes to Mars, Jupiter and beyond. The ISS, orbiting Earth at about 400 km, serves as a hub for research. With missions**	

	planned for 2030, humanity's cosmic journey continues! Then the function should display: **incredible advancements science. agencies serves research.**	
Ans	(b) **def showWords():** **with open("Space.txt",'r') as F:** **All=F.read()** **Words=All.split()** **for word in Words:** **if word.count('e')>=2:** **print(word, end=' ')** **OR** **def showWords():** **F = open("Space.txt") #'r'/ 'rt' is optional** **All=F.readlines()** **for L in All:** **Words=L.split()** **for Word in Words :** **C=Word.count('e')** **if C>=2:** **print(Word, end= ' ')** **F.close()** **OR** **Any other equivalent correct code**	
	(½ mark for opening the file in default/correct mode) ***(½ mark for correct reading or similar operation)*** ***(½ mark for correct iteration)*** ***(1 mark for correctly checking the condition)*** ***(½ mark for displaying the result)***	
30.	(a) A stack named **FruitStack**, implemented using list, contains records of some fruits. Each record is represented as a dictionary with keys '**Name**', '**Origin**', '**Price**' and '**Expiry**'. A sample record is given here: **{'Name':'Apple','Origin':'France','Price':120, 'Expiry':'12-08-2025'}** Write the following user-defined functions in Python to perform the specified operations on **FruitStack :** (i) **push_fruit(FruitStack,Fruit) :** This function takes the stack **FruitStack** and a new record **Fruit** as arguments and pushes the record stored in **Fruit** onto **FruitStack** if the **Price** is less than 100.	3x1 =3

(ii) **pop_fruit(FruitStack) :** This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display **"UNDERFLOW"**.

(iii) **display(FruitStack) :** This function displays all the elements of the stack starting from the topmost element. If the stack is empty, the function should display **'EMPTY STACK'**.

Ans

(i)

```
def push_fruit(FruitStack, Fruit):
    if Fruit['Price']<100:
        FruitStack.append(Fruit)
```

OR

```
def push_fruit(FruitStack, Fruit):  #Option 2(i)
    if Fruit['Price']<100:
        FruitStack.insert(0,Fruit)
```

OR

Any similar, equivalent, correct code

(½ mark for correctly checking the condition)
(½ mark for correctly pushing Fruit)

(ii)

```
def pop_fruit(FruitStack):
  if FruitStack==[]:
      # OR if not FruitStack:
      # OR if len(FruitStack)==0:
      print('UNDERFLOW')
  else:
      return FruitStack.pop()
```

OR

```
def pop_fruit(FruitStack):          #Option 2(ii)
  if FruitStack==[]:
      # OR if not FruitStack:
      # OR if len(FruitStack)==0:
      print('UNDERFLOW')
  else:
      return FruitStack.pop(0)
```

OR

Any similar, equivalent, correct code

(½ mark for correctly checking and displaying 'Underflow')
(½ mark for correctly popping and returning the element)

(iii)

```
def display(FruitStack):
  if FruitStack==[]:
      # OR if not FruitStack:
      # OR if len(FruitStack)==0:
      print('EMPTY STACK')
  else:
      for ele in FruitStack[::-1]:
        print(ele)
```

OR

```
def display(FruitStack):          #Option 2(iii)
  if FruitStack==[]:
     # OR if not FruitStack:
     # OR if len(FruitStack)==0:
     print('EMPTY STACK')
  else:
    for ele in FruitStack:
      print(ele)
```

OR

Any similar, equivalent, correct code

(½ mark for correctly checking the whether the stack is empty)
(½ mark for correctly displaying the stack)

OR

(b) Write a Python program to accept 10 integers from the user. If the entered number is a three digit even integer, push it onto a stack. After all inputs are taken, pop all the three-digit even integers from the stack and display them. For example, if the user enters `12, 31, 320, 457, 6, 92, 924, 220, 1, 218,` then the stack should contain :
`320, 924, 220, 218`

and the output of the program should be :
`218 220 924 320`

Ans (b)

```
Stack=[] #Stack
for C in range(10):
  Num=int(input("Integer:"))
  if Num>=100 and Num<=999 and Num%2==0:
  #if len(str(Num))==3 and Num%2==0:
     Stack.append(Num)
while Stack:
     print(Stack.pop(), end=' ')
```

OR

Any similar, equivalent, correct code with/without user defined function

(½ mark for correctly declaring/defining the stack)
(½ mark for correctly entering/inputting the numbers in a loop)
(½ mark for correctly checking the condition)
(½ mark for pushing the correct number)
(½ mark for the correct loop)
(½ mark for correctly popping and displaying the stack elements)

31. (a) Write the output of the following code : 3

```
def Exam2026(given) :
     new=[]
     for ch in given [1:-1]:
          if ch.isupper():
               new.reverse()
          elif ch not in new:
              new.append(ch)
          elif ch in new:
```

```
                    new.pop()
               print(new)
          Exam2026("Gold-24Medals")
```

Ans **(a)** `['4', '2', '-', 'd', 'l', 'o']`

(½ Mark for each correct letter/digit/sign in the right order)
(Deduct ½ mark if the container list is not correctly shown)

OR

(b) Write the output of the following code

```
def Exam2026(given):
     new = 0
     while given:
          if new % 2:
               new += given % 10
          else:
               new += given % 5
          print(new, end = '-')
          given //= 10
Exam2026(123456)
```

Ans **(b) 1-6-10-13-15-16-**

(½ mark for each correct number in the right order)
(Deduct ½ mark if the dashes (-) are not shown or incorrectly shown)

SECTION D **(4x4=16)**

32. Abhishek has created a table, named **STOCK**, with a set of records to maintain the data of packaged milk in his shop. After creating the table, he entered the data and the table looked as follows : 4

Code	Type	Volume	Qty	Price
AF0.5	F	0.5	300	38.00
MF0.5	F	0.5	250	36.50
MT1.0	T	1.0	150	64.00
AT1.0	T	1.0	100	66.00
PD1.0	D	1.0	50	52.00
PT0.5	T	0.5	78	30.00

(a) Based on the data given above, write the SQL queries for the following tasks:

(i) To display **Type** and the maximum **Price** for each **Type** of milk.

Ans **(a)**

(i)

```
SELECT TYPE, MAX(PRICE) FROM STOCK
GROUP BY TYPE;
```

	(½ Mark for ***SELECT TYPE, MAX(PRICE) FROM STOCK****)* *(½ Mark for* ***GROUP BY TYPE;****)*	
	(ii) For each record, increase the **Price** by **0.5** where **Type** is **'F'**.	
Ans	**(ii)** **UPDATE STOCK** **SET PRICE=PRICE+0.5 WHERE TYPE='F';**	
	(½ Mark for ***UPDATE STOCK****)* *(½ Mark for* ***SET PRICE=PRICE+0.5 WHERE TYPE='F'****)*	
	(iii) To display the total value of the stock (total of **Qty** × **Price**).	
Ans	**(iii)** **SELECT SUM(QTY*PRICE) FROM STOCK;**	
	(½ Mark for correct ***SELECT ...FROM...****)* *(½ Mark for* ***SUM(****QTY*PRICE****)****)*	
	(iv) To display the details of all records where **Code** starts with **'A'**.	
Ans	**(iv)** **SELECT * FROM STOCK** **WHERE CODE LIKE 'A%';** **OR WHERE CODE LIKE 'A____'**	
	(½ Mark for correct ***SELECT ...FROM...****)* *(½ Mark for for correct condition)*	
	OR (b) Considering the table **STOCK** as given above, write the output on execution of the following queries : (i) **SELECT Volume, Qty, Price FROM STOCK** **WHERE Type IN ('F','D');**	
Ans	**(i)** **VOLUME QTY PRICE** **0.5 300 38.00** **0.5 250 36.50** **1.0 50 52.00**	
	(½ Mark for any 2 rows with correct values) *(½ Mark for remaining row with correct values)* *Note: Ignore the output header*	
	(ii) **SELECT Code, Qty FROM STOCK** **WHERE Price BETWEEN 30 AND 50;**	
Ans	**(ii)** **CODE QTY** **AF0.5 300** **MF0.5 250** **PT0.5 78**	
	(½ Mark for any 2 rows with correct values)	

	(½ Mark for remaining row with correct values) *Note: Ignore the output header*	
	(iii) `SELECT DISTINCT Type FROM STOCK;`	

Ans	**(iii)**
	`DISTINCT TYPE`
	`F`
	`T`
	`D`	

	(½ Mark for any 2 rows with correct values) *(½ Mark for remaining row with correct value)* *Note: Ignore the output header*	

	(iv)
	`SELECT Volume, count(*) FROM STOCK`
	`GROUP BY Volume;`	

Ans	**(iv)**
	`VOLUME  COUNT(*)`
	`0.5  3`
	`1.0  3`	

	(½ Mark for one row with correct values) *(½ Mark for remaining row with correct values)*	
33.	A csv file "**States.csv**" contains some data about all the states of India. Each record of the file contains the following data : ● Name of the State ● Capital of the State ● Population of the State ● Official Language of the State For example, a sample record in the file is : `['Andhra Pradesh','Amaravati',52221000,'Telugu']` Write a Python program which reads the data from this file and appends all those records where population is more than 10000000 into another csv file `'More.csv'`. **Note** : "**States.csv**" also contains the Header row. The Header row should NOT be copied to "**More.csv**".	4

Ans	`import csv`
	`with open('States.csv') as F1 :`
	`  with open('More.csv','a',newline='') as F2:`
	`  # file mode 'w' is also acceptable`
	`  R=csv.reader(F1)`
	`  W=csv.writer(F2)`
	`  RECS=list(R)`
	`  for rec in RECS[1:]:#skipping the Header row`
	`  if int(rec[2])>10000000:`
	`  W.writerow(rec)`
	OR
	`import csv`
	`F1=open('States.csv')`
	`F2=open('More.csv','a') # mode 'w' is also acceptable`	

```
    R=csv.reader(F1)
    W=csv.writer(F2)
    RECS=list(R)
    for rec in RECS[1:]:    #skipping the Header row
      if int(rec[2])>10000000:
        W.writerow(rec)
    F1.close()
    F2.close()
```

OR

```
    import csv
    F1=open("States.csv","r")
    R=list(csv.reader(F1))
    Data=[]
    for rec in R[1:]:       #skipping the Header row
      if int(rec[2])>10000000:
        Data.append(rec)
    F1.close()

    F2=open("More.csv","w")
    W=csv.writer(F2)
    W.writerows(Data)
    F2.close()
```

OR

Any similar, equivalent, correct code

(½ mark for correctly opening "States. csv")
(½ mark for correctly opening "More. csv")
(½ mark for correctly creating the reader object)
(½ mark for correctly creating the writer object)
(½ mark for correctly skipping the header row)
(½ mark for iteration of records)
(½ mark for correctly checking the condition)
(½ mark for correctly writing the record in "More. csv")

Note:

- ***Ignore newline clause , Ignore import csv, Ignore close() method(s)***

34. Assume that you are the Manager of the Loans department of a Finance House. To keep track of the loans you have created two tables : **CUSTOMERS** and **LOANS**. The sample data in these tables is given below : 4x1 =4

Table : CUSTOMERS

C_ID	C_Name	Phone
00001	Raj Malhotra	1234567890
00003	David Xavier	3456789012
00004	Damini Iyer	3156789012
00008	Abdul	2345678901

Table : LOANS

SNo	C_ID	L_Amt	L_Date	Terms	RoI

1	00003	200000	2025-12-06	60	7.80
2	00008	2500000	2023-08-09	60	9.00
3	00001	500000	2025-08-13	48	6.00
4	00003	300000	2026-12-07	36	8.00
5	00004	600000	2026-12-07	60	6.00

Note :The tables may contain more records than shown here.
The management of the Finance House needs certain reports from you.
Write the queries to extract the following data to create the reports :

(i) Number of records from **LOANS** table where Rate of Interest (**RoI**) is above 7.0.

Ans (i)
```
SELECT COUNT(*) FROM LOANS
   WHERE RoI > 7.0;
```

(½ Mark for SELECT COUNT(*) FROM LOANS)
(½ Mark for WHERE RoI > 7.0)

(ii) Names of the customers whose loan amount (**L_Amt**) is above 1000000.

(ii)
```
SELECT C_Name
FROM CUSTOMERS
JOIN LOANS ON CUSTOMERS.C_ID = LOANS.C_ID
WHERE L_Amt > 1000000;
```
OR
```
SELECT C_Name
FROM CUSTOMERS, LOANS
WHERE CUSTOMERS.C_ID = LOANS.C_ID
AND L_Amt > 1000000;
```
OR
```
SELECT C_Name
FROM CUSTOMERS
NATURAL JOIN LOANS
WHERE L_Amt > 1000000;
```
OR
```
SELECT C_Name
FROM CUSTOMERS
JOIN LOANS ON CUSTOMERS.C_ID = LOANS.C_ID
WHERE L_Amt > 1000000
GROUP BY C_Name;
```
OR
```
SELECT C_Name
FROM CUSTOMERS
JOIN LOANS ON CUSTOMERS.C_ID = LOANS.C_ID
GROUP BY C_Name
HAVING SUM(L_Amt) > 1000000;
```
OR

Any other correct SQL Command

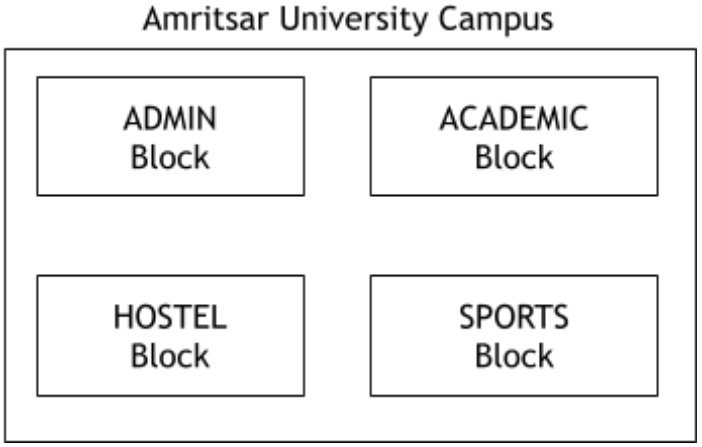
(½ Mark for correct selection from both the tables)
(½ Mark for correct uses of JOIN and WHERE clause)

	(iii) **C_ID, C_Name**, and **Terms** of all those records where Loan Date (**L_Date**) is after 31st December, 2024.	
	(iii) **SELECT L.C_ID, C_NAME, TERMS** **FROM CUSTOMERS C, LOANS L** **WHERE C. C_ID = L.C_ID AND L_DATE > '2024-12-31';** **OR** **SELECT CUSTOMERS.C_ID, C_Name, Terms** **FROM CUSTOMERS** **JOIN LOANS ON CUSTOMERS.C_ID = LOANS.C_ID** **WHERE L_Date > '2024-12-31';** **OR** **SELECT CUSTOMERS.C_ID, C_Name, Terms** **FROM CUSTOMERS, LOANS** **WHERE CUSTOMERS.C_ID = LOANS.C_ID** **AND L_Date > '2024-12-31';** **OR** **SELECT C.C_ID, C_NAME, TERMS** **FROM CUSTOMERS C NATURAL JOIN LOANS** **WHERE L_DATE > '2024-12-31';** **OR** **SELECT C.C_ID, C.C_Name, L.Terms** **FROM CUSTOMERS C, LOANS L** **WHERE C.C_ID = L.C_ID** **AND L.L_Date > '2024-12-31';** **OR** **Any other correct SQL Command**	
	(½ Mark for correct selection from both tables) ***(½ Mark for correct uses of JOIN and WHERE clause)***	
	(iv) (a) Details of all the loans in the descending order of **RoI**.	
	(iv) (a) **SELECT * FROM LOANS** **ORDER BY RoI DESC;** **OR** **Any other correct SQL Command**	
	(½ Mark for correct SELECT ... FROM...) ***(½ Mark for correct use of ORDER BY ...)***	
	OR **(iv)** (b) **C_ID** and average term for each **C_ID** from the **LOANS** table.	
	(iv) (b) **SELECT C_ID, AVG(TERMS) FROM LOANS** **GROUP BY C_ID;** **OR** **Any other correct SQL Command**	

	(½ Mark for correct SELECT Query with AVG or SUM/COUNT function) *(½ Mark for correct use of GROUP BY)*	
35.	Peter has created a table named **Account** in **MySQL** database, **SCHOOL**, having following structure : • **Stud_id** – integer • **Sname** – string • **Class** – string • **Fees** – float Help him in writing a Python program to display records of those students whose fees is less than 5000. Note the following to establish connectivity between Python and **MySQL** : • Username – **admin** • Password – **root** • Host – **localhost**	4
Ans	**import pymysql as pm # OR import mysql.connector as pm** **DB = pm.connect(host='localhost',user='admin', ** **password='root', database = 'SCHOOL'))** **CUR = DB.cursor()** **SQL = "SELECT * FROM Account WHERE Fees<5000"** **CUR.execute(SQL)** **Data=CUR.fetchall( )** **for D in Data:** **print(D)** **DB.close()** **OR** **import pymysql as pm # OR import mysql.connector as pm** **DB = pm.connect(host='localhost',user='admin', ** **password='root', database = 'SCHOOL'))** **CUR = DB.cursor()** **SQL = "SELECT * FROM Account WHERE Fees<5000"** **CUR.execute(SQL)** **for C in CUR:** **print(C)** **DB.close()** **OR** **Any equivalent valid and correct code**	
	(1 Mark for creating correct connectivity) *(½ Mark for creating the cursor)* *(½ Mark for correct formation of Query)* *(½ Mark for correct execution of the query)* *(½ Mark for correctly fetching the data with/without using fetchall)* *(1 Mark for correctly displaying the data)* *Note:* *(½ Mark for importing correct module, if the marks allocated are less than 4)*	
	SECTION E	**(2x5=10)**

36.	NextStep is an organization which has a pool of resource persons to conduct training workshops on various topics related to ICT. The data of all its Resource Persons is stored in a binary file '**RESOURCES.DAT**' using the following record structure (each record is a tuple) : **(R_ID, R_Name, R_Expertise, Charges)** where : **R_ID** – Resource Person's ID (An integer) **R_Name** – Resource Person's Name (A string) **R_Expertise** – Area of expertise of the Resource Person **Charges** – Charges (in rupees) per hour to conduct a workshop For example, a record in the file is : **(12,'P. Velusami', 'Machine Learning',5000)** In this context, write the following user defined functions in Python :	**2+3= 5**
	(i) **Append()** – To input the data of a Resource Person and write it in the file **RESOURCES.DAT.**	
Ans	(i) **import pickle** **def Append(): #Assuming independent tuples in file** **F=open("RESOURCES.DAT","ab")** **R_ID = int(input("Resource Person ID:"))** **R_Name = input("Resource Person Name:")** **R_Expertise = input("Area of Expertise:")** **Charges = int(input("Hourly Charges:"))** **Rec=(R_ID, R_Name, R_Expertise, Charges)** **#[R_ID, R_Name, R_Expertise, Charges] also valid** **pickle.dump (Rec, F)** **F.close()** **OR** **def Append(): #Assuming list of tuples in file** **with open("RESOURCES.DAT","rb+") as F:** **Rec=pickle.load(F)** **R_ID = int(input("Resource Person ID:"))** **R_Name = input("Resource Person Name:")** **R_Expertise = input("Area of Expertise:")** **Charges = int(input("Hourly Charges:"))** **Rec.append((R_ID, R_Name, R_Expertise, Charges))** **F.seek(0)** **pickle.dump(Rec,F)** **OR** # Also consider a code, which reads from file using rb, and writes the # appended content of records by reopening the same file in wb mode or # dumping the content in a new file **OR** **Any other equivalent correct code**	
	(i) ***(½ Mark for opening the file in correct mode)***	

	(½ Mark for inputting the details of the record) *(½ Mark for formation of the tuple or list of the record)* *(½ Mark for correctly dumping the tupe/list)*	
	(ii) **Update()** – To increase the **Charges** of each resource person by **500.**	
	(ii) **import pickle** **def Update(): #Assuming independent tuples in file** **F=open("RESOURCES.DAT","rb+")** **try:** **while True:** **Pos=F.tell()** **Rec=pickle.load(F)** **Newrec=list(Rec)** **Newrec[3]+=500** **F.seek(Pos)** **pickle.dump(tuple(Newrec),F)** **except:** **F.close()** **OR** **import pickle #Assuming list of tuples in file** **def Update():** **with open("RESOURCES.DAT","rb+") as F:** **Rec = pickle.load(F)** **for I in range(len(Rec)):** **Rec[I]=list(Rec[I])** **Rec[I][3]+=500** **F.seek(0)** **pickle.dump(Rec,F)** **OR** # Also consider a code, which reads from file using rb, and writes the # updated record by reopening the same file in wb mode or dumping the # content in a new file **OR** **Any other equivalent correct code**	
	(ii) ***(1 Mark for opening the file in correct modes)*** ***(½ Mark for reading/loading data correctly)*** ***(½ Mark for correct iteration)*** ***(½ Mark for incrementing the specified data correctly)*** ***(½ Mark for writing/dumping modified data)***	
37.	Sanjeevani is a big group of educational institutions with its head office in Hyderabad. It is planning to set up a new University in Amritsar. The Amritsar University Campus will have four block/buildings – ADMIN, ACADEMIC, HOSTEL, SPORTS. You, as a network expert, need to suggest the best network – related solutions for them to resolve the issues/problems mentioned in points (i) to (v), keeping in mind the distances between various blocks/buildings and other given parameters.	**5x1 =5**



Block to Block distances (in Mtrs) :

FROM	TO	DISTANCE
ADMIN	ACADEMIC	60 M
ADMIN	HOSTEL	160 M
ADMIN	SPORTS	80 M
ACADEMIC	HOSTEL	40 M
ACADEMIC	SPORTS	120 M
HOSTEL	SPORTS	150 M

Distance of Hyderabad Head Office from Amritsar University Campus = 2000 km

Number of computers in each block is as follows :

ADMIN	25
ACADEMIC	600
HOSTEL	120
SPORTS	50

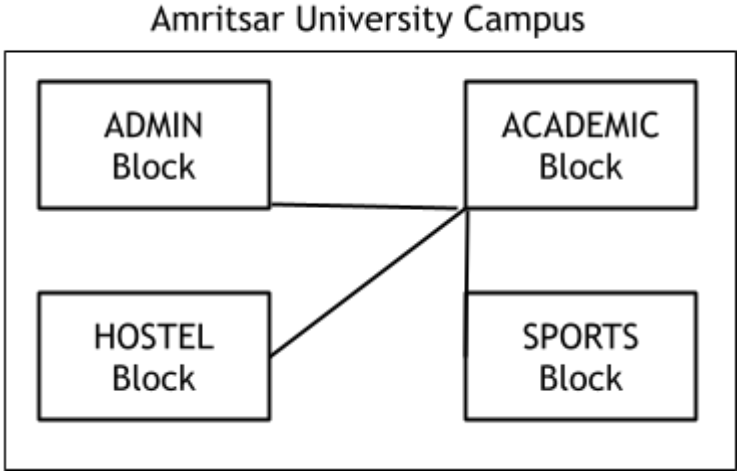
(i) Suggest the most appropriate location of the server inside the Amritsar University Campus. Justify your choice.

Ans (i) Academic Block as it has the maximum number of computers
OR
Academic Block as it requires minimum cable length
OR
Any other similar answer with valid justification

(1 mark for suggesting a block with valid justification)

(ii) Draw the cable layout to efficiently connect various blocks within the Amritsar University Campus.

Ans (ii)

	 **OR** **Diagram shown as per the Minimum Distances**	
	(1 mark for drawing the correct cable layout)	
	(iii) Name any two wired media that can be used to connect various computers of a block inside Amritsar Campus.	
Ans	(iii) Twisted pair cable, Ethernet cable, Coaxial Cable, Optical Fiber Cable (any two)	
	(½ mark each for writing any two correct wired media names)	
	(iv) For the academic purpose, the University will provide its own 24×7 FM channel within the University Campus. Which communication medium, out of the following, is used by FM ? (A) Radio Waves (B) Micro Waves (C) Infrared Waves	
Ans	(iv) (A) Radio waves	
	(1 Mark for writing the correct option)	
	(v) (a) The students will be attending a lot of online academic sessions and workshops. These will involve audio-visual communication. Write the full name of the protocol which will be used for such a communication through the internet.	
Ans	(v) (a) Voice over Internet Protocol	
	(a) ***(1 Mark for writing the Voice Over Internet Protocol)*** ***OR*** ***(½ Mark for writing the VoIP)***	
	OR (b) Where should a repeater be installed in Amritsar University campus to boost the signal between blocks? Justify your answer.	
Ans	(b) Between Academic and Sports block because distance is more than 100m.	
	(1 Mark for writing the correct answer)	

Series : 4YWZX

SET – 4

रोल नं.
Roll No.

प्रश्न–पत्र कोड Q.P. Code	91

परीक्षार्थी प्रश्न–पत्र कोड को उत्तर–पुस्तिका के मुख–पृष्ठ पर अवश्य लिखें ।
Candidates must write the Q.P. Code on the title page of the answer-book.

कम्प्यूटर साइंस
COMPUTER SCIENCE

निर्धारित समय : 3 घण्टे
Time allowed : 3 hours

अधिकतम अंक : 70
Maximum Marks : 70

- कृपया जाँच कर लें कि इस प्रश्न–पत्र में मुद्रित पृष्ठ **31** हैं ।
- कृपया जाँच कर लें कि इस प्रश्न–पत्र में **37** प्रश्न हैं ।
- प्रश्न–पत्र में दाहिने हाथ की ओर दिए गए प्रश्न–पत्र कोड को परीक्षार्थी उत्तर–पुस्तिका के मुख–पृष्ठ पर लिखें ।
- ***कृपया प्रश्न का उत्तर लिखना शुरू करने से पहले, उत्तर–पुस्तिका में यथा स्थान पर प्रश्न का क्रमांक अवश्य लिखें ।***
- इस प्रश्न–पत्र को पढ़ने के लिए 15 मिनट का समय दिया गया है । प्रश्न–पत्र का वितरण पूर्वाह्न में 10.15 बजे किया जाएगा । 10.15 बजे से 10.30 बजे तक परीक्षार्थी केवल प्रश्न–पत्र को पढ़ेंगे और इस अवधि के दौरान वे उत्तर–पुस्तिका पर कोई उत्तर नहीं लिखेंगे ।

- Please check that this question paper contains **31** printed pages.
- Please check that this question paper contains **37** questions.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- **Please write down the serial number of the question in the answer-book at the given place before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period. ~

सामान्य निर्देश :

(i) *इस प्रश्न-पत्र में **37** प्रश्न हैं ।*

(ii) ***सभी** प्रश्न **अनिवार्य** हैं । परंतु कुछ प्रश्नों में आंतरिक विकल्प दिये गये हैं । ऐसे प्रश्नों में केवल एक विकल्प को चुनिए ।*

(iii) *इस प्रश्न-पत्र को **5** खण्डों **क, ख, ग, घ** और **ङ** में बाँटा गया है ।*

(iv) *खण्ड - **क** में **21** प्रश्न (**1** से **21**) हैं । प्रत्येक प्रश्न के लिये **1** अंक निर्धारित है ।*

(v) *खण्ड - **ख** में **7** प्रश्न (**22** से **28**) हैं । प्रत्येक प्रश्न के लिये **2** अंक निर्धारित हैं ।*

(vi) *खण्ड - **ग** में **3** प्रश्न (**29** से **31**) हैं । प्रत्येक प्रश्न के लिये **3** अंक निर्धारित हैं ।*

(vii) *खण्ड - **घ** में **4** प्रश्न (**32** से **35**) हैं । प्रत्येक प्रश्न के लिये **4** अंक निर्धारित हैं ।*

(viii) *खण्ड - **ङ** में **2** प्रश्न (**36** एवं **37**) हैं । प्रत्येक प्रश्न के लिये **5** अंक निर्धारित हैं ।*

(ix) *सभी प्रोग्रामिंग प्रश्नों का उत्तर केवल Python Language में दिया जाना है ।*

(x) *बहुविकल्पीय प्रश्नों (Multiple Choice Questions) के मामले में सही उत्तर का text भी लिखा जाना चाहिए ।*

खण्ड – क (21 × 1 = 21)

1. बतायें कि सही है या गलत : **1**

"Python List में हमेशा सभी एलिमेंट्स (elements) एक ही डेटा टाइप के होने चाहिए ।"

2. निम्नलिखित स्टेटमेंट (Statement) का आउटपुट (Output) क्या होगा ? **1**

```
print(14%3**2*4)
```

(A) 16 (B) 64

(C) 20 (D) 256

General Instructions :

(i) *This question paper contains **37** questions.*

(ii) *All questions are **compulsory**. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.*

(iii) *The paper is divided into **5** Sections – A, B, C, D and E.*

(iv) ***Section A,** consists of **21** questions (**1** to **21**). Each question carries **1** mark.*

(v) ***Section B,** consists of **7** questions (**22** to **28**). Each question carries **2** marks.*

(vi) ***Section C,** consists of **3** questions (**29** to **31**). Each question carries **3** marks.*

(vii) ***Section D,** consists of **4** questions (**32** to **35**). Each question carries **4** marks.*

(viii) ***Section E,** consists of **2** questions (**36** & **37**). Each question carries **5** marks.*

(ix) *All programming questions are to be answered using Python Language only.*

(x) *In case of MCQs, text of the correct answer should also be written.*

SECTION – A (21 × 1 = 21)

1. State True or False : **1**

"A Python List must always contain all its elements of same data type."

2. What will be the output of the following statement ? **1**

```
print(14%3**2*4)
```

(A) 16 (B) 64

(C) 20 (D) 256

3. निम्नलिखित कोड स्निपेट (code snippet) का सही आउटपुट (output) बताइये : 1

```
game="Olympic2024"
print(game.index("C"))
```

(A) `0` (B) `6`

(C) `-1` (D) `ValueError`

4. निम्नलिखित में से कौन सा आइडेंटिफाइअर (identifier) सही है ? 1

(A) `global` (B) `Break`

(C) `def` (D) `with`

5. निम्नलिखित विकल्पों में से अमान्य (invalid) Python statement को बताइए : 1

(A) `print("A",10,end="*")` (B) `print("A",sep="*",10)`

(C) `print("A",10,sep="*")` (D) `print("A"*10)`

6. नीचे दिये गए स्टेटमेंट्स (statements) पर विचार कीजिए और दिये गये विकल्पों में से सही आउटपुट (output) चुनिये : 1

```
L=['TIC', 'TAC']
print(L[::-1])
```

(A) `['CIT', 'CAT']` (B) `['TIC', 'TAC']`

(C) `['CAT', 'CIT']` (D) `['TAC', 'TIC']`

7. निम्नलिखित में से कौन सा ऑपरेटर (operator) **`True`** में इवैल्युएट (evaluate) होता है, यदि उस ऑपरेटर (operator) के दोनों तरफ के वेरिएबल (variable) समान मेमोरी स्थान (memory location) की ओर इंगित करते हैं, अन्यथा वह operator **`False`** में इवैल्युएट (evaluate) होता है ? 1

(A) `is` (B) `is not`

(C) `and` (D) `or`

3. Identify the correct output of the following code snippet : 1

```
game="Olympic2024"
print(game.index("C"))
```

(A) `0` (B) `6`

(C) `-1` (D) `ValueError`

4. Which of the following is the correct identifier ? 1

(A) `global` (B) `Break`

(C) `def` (D) `with`

5. Identify the invalid Python statement out of the following options : 1

(A) `print("A",10,end="*")` (B) `print("A",sep="*",10)`

(C) `print("A",10,sep="*")` (D) `print("A"*10)`

6. Consider the statements given below and then choose the correct output from the given options : 1

```
L=['TIC', 'TAC']
print(L[::-1])
```

(A) `['CIT', 'CAT']` (B) `['TIC', 'TAC']`

(C) `['CAT', 'CIT']` (D) `['TAC', 'TIC']`

7. Which of the following operator evaluates to **`True`** if the variable on either side of the operator points towards the same memory location and **`False`** otherwise ? 1

(A) `is` (B) `is not`

(C) `and` (D) `or`

8. नीचे दिए गए स्टेटमेंट्स (statements) पर विचार कीजिए और फिर दिये गये विकल्पों (options) में से सही आउटपुट (output) चुनिये : 1

```
D={'S01':95, 'S02':96 }
for I in D :
    print(I,end='#')
```

(A) `S01#S02#` (B) `95#96#`

(C) `S01,95#S02,96#` (D) `S01#95#S02#96#`

9. तालिका (table) तैयार करते समय कौन सा अवरोध (constraint) तालिका में प्रतिरूप मूल्यों (duplicate values) की प्रविष्टि (insertion) नहीं करने देता ? 1

(A) `UNIQUE` (B) `DISTINCT`

(C) `NOT NULL` (D) `HAVING`

10. नीचे दिए गए स्टेटमेंट्स (statements) पर विचार कीजिए और फिर दिये गये विकल्पों से सही आउटपुट (output) चुनिये : 1

```
def Change(N):
    N=N+10
    print(N,end='$$')
N=15
Change(N)
print(N)
```

(A) `25$$15` (B) `15$$25`

(C) `25$$25` (D) `2525$$`

11. नीचे दिये गये स्टेटमेंट्स (statements) पर विचार कीजिए और फिर दिये गये विकल्पों (options) से सही आउटपुट (output) चुनिये : 1

```
N='5'
try:
    print('WORD' + N, end='#')
except:
    print('ERROR',end='#')
finally:
    print('OVER')
```

(A) `ERROR#` (B) `WORD5#OVER`

(C) `WORD5#` (D) `ERROR#OVER`

8. Consider the statements given below and then choose the correct output from the given options : 1

```
D={'S01':95, 'S02':96 }
for I in D :
    print(I,end='#')
```

(A) `S01#S02#` (B) `95#96#`

(C) `S01,95#S02,96#` (D) `S01#95#S02#96#`

9. While creating a table, which constraint does not allow insertion of duplicate values in the table ? 1

(A) `UNIQUE` (B) `DISTINCT`

(C) `NOT NULL` (D) `HAVING`

10. Consider the statements given below and then choose the correct output from the given options : 1

```
def Change(N):
    N=N+10
    print(N,end='$$')
N=15
Change(N)
print(N)
```

(A) `25$$15` (B) `15$$25`

(C) `25$$25` (D) `2525$$`

11. Consider the statements given below and then choose the correct output from the given options : 1

```
N='5'
try:
    print('WORD' + N, end='#')
except:
    print('ERROR',end='#')
finally:
    print('OVER')
```

(A) `ERROR#` (B) `WORD5#OVER`

(C) `WORD5#` (D) `ERROR#OVER`

12. निम्नलिखित में से कौन सा Built-in function/method एक डिक्शनरी (dictionary) को वापिस (return) करता है ? 1

(A) `dict()` (B) `keys()`

(C) `values()` (D) `items()`

13. SQL में निम्नलिखित में से कौन सी डीएमएल कमाण्ड (DML command) है ? 1

(A) **UPDATE** (B) **CREATE**

(C) **ALTER** (D) **DROP**

14. SQL में कौन सा संगणना फंक्शन (aggregate function) नल (NULL) वैल्यूज़ (values) को अनदेखा करते हुए निर्दिष्ट कॉलम (specified column) में वैल्यूज़ (values) की संख्या प्रदर्शित करता है ? 1

(A) `len()` (B) `count()`

(C) `number()` (D) `num()`

15. MYSQL में किस प्रकार के वैल्यू (value) को उद्धरण चिह्न (Quotation marks) के अंदर नहीं दिखाना चाहिए ? 1

(A) **DATE** (B) **VARCHAR**

(C) **FLOAT** (D) **CHAR**

16. सही (True) या गलत (False) बतायें : 1

यदि तालिका (table) **A** में 6 पंक्तियाँ (rows) और 3 कॉलम (columns) हैं और तालिका **B** में 5 पंक्तियाँ और 2 कॉलम हैं, तो **A** और **B** के कार्तीय गुणनफल (Cartesian product) में 30 पंक्तियाँ (rows) और 5 कॉलम (columns) होंगे ।

17. कमज़ोर सिग्नल (signal) को दुबारा जनरेट करने और आगे संप्रेषित (transmit) करने के लिये निम्नलिखित में से कौन सा नेटवर्किंग उपकरण (Networking device) प्रयोग किया जाता है ? 1

(A) हब (Hub) (B) ईथरनेट कार्ड (Ethernet Card)

(C) रिपीटर (Repeater) (D) मॉडेम (Modem)

12. Which of the following built-in function/method returns a dictionary ? 1

(A) `dict()` (B) `keys()`

(C) `values()` (D) `items()`

13. Which of the following is a DML command in SQL ? 1

(A) `UPDATE` (B) `CREATE`

(C) `ALTER` (D) `DROP`

14. Which aggregate function in SQL displays the number of values in the specified column ignoring the NULL values ? 1

(A) `len()` (B) `count()`

(C) `number()` (D) `num()`

15. In MYSQL, which type of value should not be enclosed within quotation marks ? 1

(A) `DATE` (B) `VARCHAR`

(C) `FLOAT` (D) `CHAR`

16. State True or False : 1

If table `A` has 6 rows and 3 columns, and table `B` has 5 rows and 2 columns, the Cartesian product of `A` and `B` will have 30 rows and 5 columns.

17. Which of the following networking devices is used to regenerate and transmit the weakened signal ahead ? 1

(A) Hub (B) Ethernet Card

(C) Repeater (D) Modem

18. इंटरनेट पर फोन काल्स (phone calls) के लिये निम्नलिखित में से कौन सा विकल्प सही नियमावली (protocol) है ? 1

(A) PPP (B) FTP

(C) HTTP (D) VoIP

19. ARPANET का पूर्ण रूप (full form) लिखिए । 1

प्रश्न संख्या **20** और **21** अभिकथन (A) और तर्क (R) पर आधारित प्रश्न हैं । सही विकल्प पर निम्नलिखित रूप में निशान लगाकर उत्तर दीजिए :

(A) अभिकथन (A) और तर्क (R) दोनों सही हैं और अभिकथन (A) का सही स्पष्टीकरण तर्क (R) है ।

(B) अभिकथन (A) और तर्क (R) दोनों सही हैं और अभिकथन (A) का सही स्पष्टीकरण तर्क (R) नहीं है ।

(C) अभिकथन (A) सही है, परंतु तर्क (R) गलत है ।

(D) अभिकथन (A) गलत है, परंतु तर्क (R) सही है ।

20. **अभिकथन (A)** : `'rb'` mode का उपयोग करके खोली गई बाइनरी फाइल (binary file) के लिए `pickle.dump()` मेथड (method) एक त्रुटि (error) दिखायेगा । 1

तर्क (R) : `pickle.dump()` मेथड (method) का प्रयोग बाइनरी फाइल से पढ़ने के लिये किया जाता है ।

21. **अभिकथन (A)** : हम MYSQL में एक से अधिक तालिकाओं (tables) से रिकॉर्ड प्राप्त कर सकते हैं । 1

तर्क (R) : फॉरेन की (Foreign key) का प्रयोग दो तालिकाओं (tables) के बीच संबंध स्थापित करने के लिये किया जाता है ।

18. Which of the following options is the correct protocol used for phone calls over the internet ? **1**

(A) PPP (B) FTP

(C) HTTP (D) VoIP

19. Expand ARPANET. **1**

Q. Nos. **20** and **21** are Assertion (A) and Reason (R) based questions. Mark the correct choice as

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation for Assertion (A).

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A).

(C) Assertion (A) is true but, Reason (R) is false.

(D) Assertion (A) is false but, Reason (R) is true.

20. **Assertion (A) :** For a binary file opened using `'rb'` mode, the `pickle.dump()` method will display an error. **1**

Reason (R) : The `pickle.dump()` method is used to read from a binary file.

21. **Assertion (A) :** We can retrieve records from more than one table in MYSQL. **1**

Reason (R) : Foreign key is used to establish a relationship between two tables.

खण्ड – ख (7 × 2 = 14)

22. किसी फंक्शन (function) में रिटर्न स्टेटमेंट (**return** statement) का क्या कार्य है ? एक उदाहरण से इसे स्पष्ट कीजिए । **2**

23. पायथन (Python) में निम्नलिखित में से प्रत्येक का एक उदाहरण लिखिए : **2**

(i) सिन्टेक्स एरर (Syntax Error)

(ii) इमप्लिसिट टाईप कन्वर्जन (Implicit Type Conversion)

24. निम्नलिखित D और D1 डिक्शनरियों (dictionaries) पर विचार कीजिए : **2**

```
D={"Suman": 40, "Raj":55, "Raman":60}
D1={"Aditi":30, "Amit":90,"Raj":20}
```

(केवल बिल्ट-इन पायथन फंक्शन्स (built-in Python functions) का प्रयोग करते हुए उत्तर दीजिए ।)

(i) (a) Dictionary **D** में **"Raj"** key के अनुरूप value प्रदर्शित/वापिस करने के लिये एक statement लिखिए ।

अथवा

(b) Dictionary **D1** की लंबाई (length) प्रदर्शित करने के लिये एक statement लिखिए ।

(ii) (a) Dictionary **D** के सभी की वैल्यू पेयर्स (key-value pairs) को Dictionary **D1** के साथ जोड़ने के लिये statement लिखिए ।

अथवा

(b) Dictionary **D1** से, दी गई key, **"Amit"** वाले आईटम्स (items) को मिटाने के लिए statement लिखिए ।

25. निम्नलिखित कोड के निष्पादन (execution) पर दिए गए विकल्पों (options) से किस संभावित आउटपुट (output) के प्रदर्शित होने की आशा की जाती है ? **2**

```
import random
Cards=["Heart","Spade","Club","Diamond"]
for i in range(2):
    print(Cards[random.randint(1,i+2)],end="#")
```

(A) **Spade#Diamond#** (B) **Spade#Heart#**

(C) **Diamond#Club#** (D) **Heart#Spade#**

SECTION – B (7 × 2 = 14)

22. What does the **`return`** statement do in a function ? Explain with the help of an example. **2**

23. Write one example of each of the following in Python : **2**

(i) Syntax Error

(ii) Implicit Type Conversion

24. Consider the following dictionaries, D and D1 : **2**

```
D={"Suman": 40, "Raj":55, "Raman":60}
D1={"Aditi":30, "Amit":90,"Raj":20}
```

(Answer using built-in Python functions only)

(i) (a) Write a statement to display/return the value corresponding to the key **`"Raj"`** in the dictionary **`D`**.

OR

(b) Write a statement to display the length of the dictionary **`D1`**.

(ii) (a) Write a statement to append all the key-value pairs of the dictionary **`D`** to the dictionary **`D1`**.

OR

(b) Write a statement to delete the item with the given key **`"Amit"`** from the dictionary **`D1`**.

25. What possible output from the given options is expected to be displayed when the following code is executed ? **2**

```
import random
Cards=["Heart","Spade","Club","Diamond"]
for i in range(2):
    print(Cards[random.randint(1,i+2)],end="#")
```

(A) **`Spade#Diamond#`** (B) **`Spade#Heart#`**

(C) **`Diamond#Club#`** (D) **`Heart#Spade#`**

26. नीचे दिया गया कोड, N को एक पूर्णांक (integer) argument के रूप में स्वीकार करता है और 1 से N तक के सभी पूर्णांकों का योग प्रदर्शित करता है । निम्नलिखित कोड का सावधानी से अवलोकन कीजिए और सभी सिन्टैक्स (syntax) और तार्किक त्रुटियों (logical errors) को हटाने के बाद इसे पुनः लिखिये । सभी किये गये सुधारों को रेखांकित कीजिए । **2**

```
def Sum(N)
    for I in range(N):
        S=S+I
    return S
print(Sum(10)
```

27. निशा को एक संगठन के कर्मचारियों (staff) का डेटा (data) रखने का कार्य सौंपा गया है । उसे क्रमशः कर्मचारियों की पहचान संख्या, नाम, विभाग और मूल वेतन को स्टोर करने के लिये **EMPNO, NAME, DEPARTMENT, BASICSAL** शीर्षकों वाले **EMPLOYEES** नामक एक SQL table में कर्मचारियों (staff) के विवरण (details) रखने हैं । संगठन में एक ही नाम के दो या इससे अधिक कर्मचारी हो सकते हैं । **2**

(i) (a) निशा को उस एट्रीब्यूट (attribute) को पहचानने में सहायता कीजिए जिसे प्राइमरी की (PRIMARY KEY) बनाना चाहिए । अपने उत्तर का औचित्य बताइए ।

अथवा

(b) निशा को उस कन्स्ट्रेंट (constraint) का पता करने में सहायता दीजिए जिसे एट्रीब्यूट (attribute) **NAME** में लागू किया जाना चाहिए ताकि रिकॉर्ड में प्रविष्टि के समय कर्मचारियों के नामों को रिक्त या NULL के रूप में छोड़ा न जा सके परन्तु डुप्लिकेट वैल्यूज (duplicate values) हो सकती हैं ।

(ii) (a) **EMPLOYEES** table में **BASICSAL** विशेषक का आकार (size) बदलने के लिये SQL कमांड लिखिये ताकि इसमें अधिकतम वैल्यू (maximum value), **99999.99** को स्टोर किया जा सके ।

अथवा

(b) **EMPLOYEES** टेबल (table) को हटाने के लिए SQL कमांड लिखिये ।

28. (a) URL शब्द का पूर्ण रूप लिखिये और इसे स्पष्ट कीजिए । **2**

अथवा

(b) PPP शब्द का पूर्ण रूप लिखिए । PPP का क्या उपयोग है ?

26. The code given below accepts N as an integer argument and returns the sum of all integers from 1 to N. Observe the following code carefully and rewrite it after removing all syntax and logical errors. Underline all the corrections made. **2**

```
def Sum(N)
    for I in range(N):
        S=S+I
    return S
print(Sum(10)
```

27. Nisha is assigned the task of maintaining the staff data of an organization. She has to store the details of the staff in the SQL table named **EMPLOYEES** with attributes as **EMPNO**, **NAME**, **DEPARTMENT**, **BASICSAL** to store Employee's Identification Number, Name, Department, and Basic Salary respectively. There can be two or more Employees with the same name in the organization. **2**

(i) (a) Help Nisha to identify the attribute which should be designated as the PRIMARY KEY. Justify your answer.

OR

(b) Help Nisha to identify the constraint which should be applied to the attribute **NAME** such that the Employees' Names cannot be left empty or **NULL** while entering the records but can have duplicate values.

(ii) (a) Write the SQL command to change the size of the attribute **BASICSAL** in the table **EMPLOYEES** to allow the maximum value of **99999.99** to be stored in it.

OR

(b) Write the SQL command to delete the table **EMPLOYEES**.

28. (a) Expand and explain the term URL. **2**

OR

(b) Expand the term PPP. What is the use of PPP ?

खण्ड – ग (3 × 3 = 9)

29. (a) एक पायथन फंक्शन (Python function) लिखिये जो एक टेक्सट फाइल **"Elections.txt"** से **'vote'** शब्द वाली सभी पंक्तियों को प्रदर्शित करता है । उदाहरण के लिये, यदि फाइल में यह है : **3**

In an election many people vote to choose their representative.
The candidate getting the maximum share of votes stands elected.
Normally, one person has to vote once.
The process of voting may vary with time and region.

तब output यह होना चाहिए :

In an election many people vote to choose their representative.
Normally, one person has to vote once.

अथवा

(b) एक पायथन फंक्शन (Python function) लिखिये जो **"Report.txt"** नामक टेक्सट फाइल से एक स्वर (vowel) से शुरू और समाप्त होने वाले सभी शब्दों को प्रदर्शित करता है । क्रमगत (consecutive) शब्द output में एक अंतराल (space) द्वारा अलग-अलग किये जाने चाहिए । उदाहरण के लिये यदि फाइल में यह है :

Once there was a wise man in a village.
He was an awesome story-teller.
He was able to keep people anchored while listening to him.

तब output यह होना चाहिए :

Once a a awesome able

30. (a) **ClrStack** नामक एक संग्रहण (stack) में कुछ रंगों का रिकॉर्ड है । प्रत्येक रिकॉर्ड एक टपल (tuple) के रूप में चार तत्त्वों-**ColorName, RED, GREEN, BLUE** को प्रदर्शित करता है । **ColorName** एक स्ट्रिंग (string) है और **RED, GREEN, BLUE** पूर्णांक (integers) हैं । उदाहरण के लिये संग्रहण (stack) में एक रिकॉर्ड **('Yellow', 237, 250, 68)** हो सकता है । **3 × 1 = 3**

ClrStack पर विनिर्दिष्ट operations करने के लिये पायथन (Python) में निम्नलिखित यूज़र-डिफाइन्ड फंक्शन्स (user-defined functions) लिखिए :

(i) **push_Clr(ClrStack, new_Clr) :** यह फंक्शन (function) stack **ClrStack** और नये रिकॉर्ड **new_Clr** को आरग्यूमेंट (Arguments) के रूप में लेता है और इस नये रिकॉर्ड को संग्रहण (stack) में डालता है ।

(ii) **pop_Clr(ClrStack) :** यह फंक्शन (function) संग्रहण (stack) से सर्वोच्च रिकॉर्ड को पॉप (pop) करता है और इसे वापिस (return) करता है । यदि स्टैक (stack) पहले से ही रिक्त हो तो फंक्शन को **"Underflow"** संदेश प्रदर्शित करना चाहिए ।

(iii) **isEmpty(ClrStack) :** यह फंक्शन (function) यह जाँच करता है कि क्या stack रिक्त है । यदि stack रिक्त है तो फंक्शन को **True** वापिस (return) करना चाहिए अन्यथा फंक्शन को **False** वापिस (return) करना चाहिए ।

अथवा

SECTION – C (3 × 3 = 9)

29. (a) Write a Python function that displays all the lines containing the word `'vote'` from a text file `"Elections.txt"`. For example, if the file contains : **3**

In an election many people vote to choose their representative.
The candidate getting the maximum share of votes stands elected.
Normally, one person has to vote once.
The process of voting may vary with time and region.
Then the output should be :
In an election many people vote to choose their representative.
Normally, one person has to vote once.

OR

(b) Write a Python function that displays all the words starting and ending with a vowel from a text file `"Report.txt"`. The consecutive words should be separated by a space in the output. For example, if the file contains :

Once there was a wise man in a village.
He was an awesome story-teller.
He was able to keep people anchored while listening to him.

Then the output should be :

Once a a awesome able

30. (a) A stack, named `ClrStack`, contains records of some colors. Each record is represented as a tuple containing four elements – `ColorName, RED, GREEN, BLUE. ColorName` is a string, and `RED, GREEN, BLUE` are integers. For example, a record in the stack may be `('Yellow', 237, 250, 68)` **3 × 1 = 3**

Write the following user-defined functions in Python to perform the specified operations on `ClrStack:`

(i) `push_Clr(ClrStack, new_Clr):` This function takes the stack `ClrStack` and a new record `new_Clr` as arguments and pushes this new record onto the stack.

(ii) `pop_Clr(ClrStack):` This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display the message `"Underflow"`.

(iii) `isEmpty(ClrStack):` This function checks whether the stack is empty. If the stack is empty, the function should return `True`, otherwise the function should return `False`.

OR

(b) पायथन (Python) में निम्नलिखित यूज़र डिफाइन्ड फंक्शन्स (User defined functions) को लिखिए :

(i) **push_trail(N,myStack) :** यहाँ **N** और **mystack** लिस्ट्स (lists) हैं और **myStack** एक stack को प्रदर्शित (represent) करता है । इस फंक्शन को list **N** से अंतिम 5 elements, **myStack** स्टैक (stack) में भेजने चाहिए । उदाहरण के लिये यदि सूची **N [1,2,3,4,5,6,7]** है, तो फंक्शन (function) **push_trail()** को **3,4,5,6,7** elements, stack में भेजने चाहिए । इसलिए stack की वैल्यू (value) **[3,4,5,6,7]** होगी ।

यह मानिये कि **N** में कम से कम 5 एलिमेंट्स (elements) हैं ।

(ii) **pop_one(myStack) :** इस फंक्शन को स्टैक (stack) **myStack** से एक element पॉप (pop) करना चाहिए और इस element को वापिस (return) करना चाहिए । यदि stack रिक्त हो तो फंक्शन को **'Stack Underflow'** संदेश प्रदर्शित करना चाहिए और **None** वापिस (return) करना चाहिए ।

(iii) **display_all(myStack) :** फंक्शन को स्टैक **myStack** के सभी elements, बिना उनको हटाये, प्रदर्शित करने चाहिए । यदि stack रिक्त है तो फंक्शन को **'Empty Stack'** संदेश प्रदर्शित करना चाहिए ।

31. (a) निम्नलिखित कोड का आउटपुट (output) बताइए : **3**

```
def ExamOn(mystr) :
    newstr = ""
    count = 0
    for i in mystr:
        if count%2 != 0:
            newstr = newstr + str(count-1)
        else:
            newstr = newstr + i.lower ()
        count += 1
    newstr = newstr + mystr[:2]
    print("The new string is:", newstr)
ExamOn("GenX")
```

अथवा

(b) Write the following user-defined functions in Python :

(i) **`push_trail(N,myStack)`** : Here **`N`** and **`mystack`** are lists, and **`myStack`** represents a stack. The function should push the last 5 elements from the list **`N`** onto the stack **`myStack`**. For example, if the list **`N`** is **`[1,2,3,4,5,6,7]`**, then the function **`push_trail()`** should push the elements **`3,4,5,6,7`** onto the stack. Therefore the value of stack will be **`[3,4,5,6,7]`**.

Assume that **`N`** contains at least 5 elements.

(ii) **`pop_one(myStack)`** : The function should pop an element from the stack **`myStack`**, and return this element. If the stack is empty, then the function should display the message **`'Stack Underflow'`**, and return **`None`**.

(iii) **`display_all(myStack)`** : The function should display all the elements of the stack **`myStack`**, without deleting them. If the stack is empty, the function should display the message **`'Empty Stack'`**.

31. (a) Predict the output of the following code : **3**

```
def ExamOn(mystr) :
    newstr = ""
    count = 0
    for i in mystr:
        if count%2 != 0:
            newstr = newstr + str(count-1)
        else:
            newstr = newstr + i.lower()
        count += 1
    newstr = newstr + mystr[:2]
    print("The new string is:", newstr)
ExamOn("GenX")
```

OR

(b) निम्नलिखित पायथन कोड के निष्पादन (execution) पर आउटपुट (output) लिखिये :

```
def Change(X):
    for K,V in X.items():
    L1.append(K)
    L2.append(V)
D={1:"ONE",2:"TWO",3:"THREE"}
L1=[]
L2=[]
Change(D)
print(L1)
print(L2)
print(D)
```

खण्ड - घ **(4 × 4 = 16)**

32. सुमन ने निर्माण स्थल (construction site) के आँकड़े (data) रखने के लिये एक रिकॉर्ड सेट के साथ **WORKER** नामक एक तालिका (table) तैयार की है जिसमें **WID, WNAME, WAGE, HOURS, TYPE,** और **SITEID** शामिल हैं । तालिका तैयार करने के बाद वह इसमें आँकड़ों (data) की निम्नलिखित रूप में प्रविष्टि करती है : 4

WID	WNAME	WAGE	HOURS	TYPE	SITEID
W01	Ahmed J	1500	200	Unskilled	103
W11	Naveen S	520	100	Skilled	101
W02	Jacob B	780	95	Unskilled	101
W15	Nihal K	560	110	Semiskilled	NULL
W10	Anju S	1200	130	Skilled	103

(b) Write the output on execution of the following Python code:

```
def Change(X):
    for K,V in X.items():
    L1.append(K)
    L2.append(V)
D={1:"ONE",2:"TWO",3:"THREE"}
L1=[]
L2=[]
Change(D)
print(L1)
print(L2)
print(D)
```

SECTION – D (4 × 4 = 16)

32. Suman has created a table named **WORKER** with a set of records to maintain the data of the construction sites, which consists of **WID**, **WNAME**, **WAGE**, **HOURS**, **TYPE**, and **SITEID**. After creating the table, she entered data in it, which is as follows : 4

WID	WNAME	WAGE	HOURS	TYPE	SITEID
W01	Ahmed J	1500	200	Unskilled	103
W11	Naveen S	520	100	Skilled	101
W02	Jacob B	780	95	Unskilled	101
W15	Nihal K	560	110	Semiskilled	NULL
W10	Anju S	1200	130	Skilled	103

(a) ऊपर दिये गये आँकड़ों (data) के आधार पर निम्नलिखित प्रश्नों के उत्तर दीजिए :

(i) **800** से **1500** के बीच की मजदूरी वाले कर्मचारियों के नाम और मजदूरी (wages) को प्रदर्शित करने के लिये SQL statement लिखिये ।

(ii) जिन कर्मचारियों की **SITEID** ज्ञात नहीं है, उनका रिकॉर्ड प्रदर्शित करने के लिये SQL statement लिखिए ।

(iii) उन सभी मजदूरों जिनका **TYPE 'Skilled'** है, उनका **WNAME**, **WAGE** और **HOURS** प्रदर्शित करने के लिए SQL statement लिखिए ।

(iv) जिन मज़दूरों का **TYPE "Semiskilled"** है, उन सभी का **WAGE** 1200 करने के लिए SQL statement लिखिए ।

अथवा

(b) ऊपर दी गई **WORKER** तालिका पर विचार करते हुए निम्नलिखित SQL कमांड के निष्पादन (execution) पर आउटपुट (output) बताइये :

(i)
```
SELECT WNAME, WAGE*HOURS FROM WORKER WHERE
SITEID = 103;
```

(ii)
```
SELECT COUNT(DISTINCT TYPE) FROM WORKER;
```

(iii)
```
SELECT MAX(WAGE), MIN(WAGE), TYPE FROM WORKER
GROUP BY TYPE;
```

(iv)
```
SELECT WNAME,SITEID FROM WORKER WHERE
TYPE="Unskilled" ORDER BY HOURS;
```

33. **"P_record.csv"** नामक एक csv फाइल में एक अस्पताल के मरीज़ों के रिकॉर्ड रखे गये हैं । फाइल के प्रत्येक रिकॉर्ड में निम्नलिखित आँकड़े (data) हैं : **4**

- रोगी का नाम
- बीमारी
- जितने दिन रोगी भर्ती रहा
- धनराशि

उदाहरण के लिये फाइल का नमूना रिकॉर्ड यह हो सकता है :

```
["Gunjan","Jaundice",4,15000]
```

इस फाइल में विनिर्दिष्ट कार्य करने के लिये निम्नलिखित Python functions लिखिए :

(i) **read_data()** फंक्शन लिखिये जो फाइल से सभी डेटा (data) को पढ़ता है और सभी **'Cancer'** रोगियों के विवरण प्रदर्शित करता है ।

(ii) **count_rec()** फंक्शन लिखिये जो फाइल की रिकॉर्ड संख्या की गणना करता है और वापिस (returns) करता है ।

(a) Based on the data given above, answer the following questions :

(i) Write the SQL statement to display the names and wages of those workers whose wages are between **800** and **1500**.

(ii) Write the SQL statement to display the record of workers whose **SITEID** is not known.

(iii) Write the SQL statement to display **WNAME**, **WAGE** and **HOURS** of all those workers whose **TYPE** is **'Skilled'**.

(iv) Write the SQL statement to change the **WAGE** to 1200 of the workers where the **TYPE** is **"Semiskilled"**.

OR

(b) Considering the above given table **WORKER**, write the output on execution of the following SQL commands :

(i)
```
SELECT WNAME, WAGE*HOURS FROM WORKER WHERE
SITEID = 103;
```

(ii)
```
SELECT COUNT (DISTINCT TYPE) FROM WORKER;
```

(iii)
```
SELECT MAX(WAGE), MIN(WAGE), TYPE FROM WORKER
GROUP BY TYPE;
```

(iv)
```
SELECT WNAME,SITEID FROM WORKER WHERE
TYPE="Unskilled" ORDER BY HOURS;
```

33. A csv file **"P_record.csv"** contains the records of patients in a hospital. Each record of the file contains the following data : **4**

- Name of a patient
- Disease
- Number of days patient is admitted
- Amount

For example, a sample record of the file may be :

```
["Gunjan","Jaundice",4,15000]
```

Write the following Python functions to perform the specified operations on this file :

(i) Write a function **read_data()** which reads all the data from the file and displays the details of all the **'Cancer'** patients.

(ii) Write a function **count_rec()** which counts and returns the number of records in the file.

34. यह मानिये कि आप रचनात्मक कला दीर्घा (सी.ए.जी.) (Creative Art Gallery (CAG)) के आई टी (IT) विभाग में कार्य कर रहे हैं, जो पेन्टिंग्स, मूर्तियाँ (Sculptures) आदि जैसी विभिन्न प्रकार की कलाकृतियों को बेचती है । कलाकृतियों (Art creations) और कलाकारों (Artists) के आँकड़े (data) क्रमशः तालिका (table) **Articles** और **Artists** में रखे जाते हैं । इन दो तालिकाओं से कुछ रिकॉर्ड्स इस प्रकार हैं : $4 \times 1 = 4$

Table : Articles

Code	A_Code	Article	DOC	Price
PL001	A0001	Painting	2018-10-19	20000
SC028	A0004	Sculpture	2021-01-15	16000
QL005	A0003	Quilling	2024-04-24	3000

Table : Artists

A_Code	Name	Phone	Email	DOB
A0001	Roy	595923	r@CrAG.com	1986-10-12
A0002	Ghosh	1122334	ghosh@CrAG.com	1972-02-05
A0003	Gargi	121212	Gargi@CrAG.com	1996-03-22
A0004	Mustafa	33333333	Mf@CrAg.com	2000-01-01

टिप्पणी : ● तालिकाओं (tables) में यहाँ दिखाए गए से कहीं अधिक रिकॉर्ड्स हैं ।

● DOC निर्माण की तारीख (Date of Creation) है ।

सी.ए.जी. (रचनात्मक कला दीर्घा) के कर्मचारी के रूप में निम्नलिखित के लिये SQL queries लिखने की आपसे अपेक्षा की जाती है :

(i) मूल्यों (Price) के अवरोही (descending) क्रम में **Articles** table से सभी रिकॉर्ड्स को प्रदर्शित करने के लिए ।

(ii) जिन वस्तुओं को वर्ष **2020** में बनाया गया था उनके विवरण प्रदर्शित करने के लिए ।

(iii) **Artists** table की संरचना (structure) प्रदर्शित करने के लिए ।

(iv) (a) इक्वी-जुड़ाव (Equi Join) के द्वारा पेन्टिंग (**Painting**) वाली कलाकृति के सभी कलाकारों के नाम प्रदर्शित करने के लिए ।

अथवा

(b) नेचुरल जुड़ाव (Natural Join) के द्वारा पेन्टिंग (**Painting**) वाली कलाकृति के सभी कलाकारों के नाम प्रदर्शित करने के लिए ।

34. Assume that you are working in the IT Department of a Creative Art Gallery (CAG), which sells different forms of art creations like Paintings, Sculptures etc. The data of Art Creations and Artists are kept in tables **Articles** and **Artists** respectively. Following are few records from these two tables : $4 \times 1 = 4$

Table : Articles

Code	A_Code	Article	DOC	Price
PL001	A0001	Painting	2018-10-19	20000
SC028	A0004	Sculpture	2021-01-15	16000
QL005	A0003	Quilling	2024-04-24	3000

Table : Artists

A_Code	Name	Phone	Email	DOB
A0001	Roy	595923	r@CrAG.com	1986-10-12
A0002	Ghosh	1122334	ghosh@CrAG.com	1972-02-05
A0003	Gargi	121212	Gargi@CrAG.com	1996-03-22
A0004	Mustafa	33333333	Mf@CrAg.com	2000-01-01

Note : ● The tables contain many more records than shown here.

● DOC is Date of Creation of an Article.

As an employee of CAG, you are required to write the SQL queries for the following :

(i) To display all the records from the **Articles** table in descending order of price.

(ii) To display the details of Articles which were created in the year **2020**.

(iii) To display the structure of **Artists** table.

(iv) (a) To display the name of all artists whose Article is **Painting** through Equi Join.

OR

(b) To display the name of all Artists whose Article is '**Painting**' through Natural Join.

35. **CINEMA** database में **THEATRE** नामक तालिका (table) की संरचना निम्नलिखित है : 4

Field	Type
Th_ID	char(5)
Name	varchar(15)
City	varchar(15)
Location	varchar(15)
Seats	int

Delete_Theatre() function लिखें जो उपयोगकर्ता (user) से **Th_ID** की वैल्यू लें और तालिका से उससे संबंधित रिकॉर्ड हमेशा के लिये हटा दें ।

पायथन डेटाबेस संयोजनता (Python-Database connectivity) के लिये निम्नलिखित मान लें :

Host : **localhost**, User : **root**, Password : **Ex2025**

खण्ड – ङ **(2 × 5 = 10)**

36. **PASSENGERS.DAT** एक फाइल है जो यात्रियों के रिकॉर्ड्स (records) को निम्नलिखित स्ट्रक्चर में संगृहीत करती है : 5

[PNR, PName, BRDSTN, DESTN, FARE]

जिसमें :

PNR – **यात्री का नंबर (string type)**

PName – **यात्री का नाम (string type)**

BRDSTN – **बोर्डिंग स्टेशन (Boarding Station) का नाम (string type)**

DESTN – **गंतव्य स्टेशन (Destination Station) का नाम (string type)**

FARE – **यात्रा के लिए किराया राशि (float type)**

निम्नलिखित कार्यों के लिये Python में यूज़र डिफाइन्ड फंक्शन्स (user defined functions) लिखिए :

(i) **Create()** – यात्रियों के लिये data इनपुट (input) करने और इसे binary file **PASSENGERS.DAT** में लिखने के लिए ।

(ii) **SearchDestn(D)** – **PASSENGERS.DAT** फाइल से कान्टेंट्स (contents) को पढ़ने और उन यात्रियों के विवरण प्रदर्शित करने के लिए जिनके **DESTN** (गंतव्य स्थान) **D** की वैल्यू (value) के अनुरूप हों ।

(iii) **UpdateFare()** – सभी यात्रियों का किराया 5% बढ़ाना और **PASSENGERS.DAT**. फाइल में अपडेट (update) किया गया रिकॉर्ड दुबारा लिखने के लिए ।

35. A table, named **THEATRE**, in **CINEMA** database, has the following structure : **4**

Field	Type
Th_ID	char(5)
Name	varchar(15)
City	varchar(15)
Location	varchar(15)
Seats	int

Write a function **Delete_Theatre()**, to input the value of **Th_ID** from the user and permanently delete the corresponding record from the table.

Assume the following for Python-Database connectivity :

Host : **localhost**, User : **root**, Password : **Ex2025**

SECTION – E **(2 × 5 = 10)**

36. A file, **PASSENGERS.DAT**, stores the records of passengers using the following structure : **5**

[PNR, PName, BRDSTN, DESTN, FARE]

where :

PNR - **Passenger Number (string type)**

PName - **Passenger Name (string type)**

BRDSTN - **Boarding Station Name (string type)**

DESTN - **Destination Station Name (string type)**

FARE - **Fare amount for the journey (float type)**

Write user defined functions in Python for the following tasks :

(i) **Create()** – to input data for passengers and write it in the binary file **PASSENGERS.DAT**.

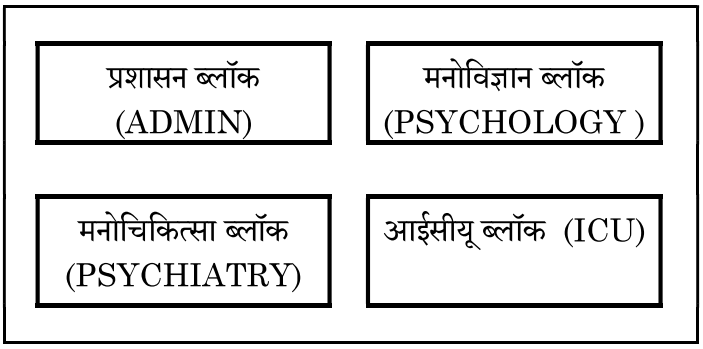
(ii) **SearchDestn(D)** – to read contents from the file **PASSENGERS.DAT** and display the details of those Passengers whose **DESTN** matches with the value of **D**.

(iii) **UpdateFare()**– to increase the fare of all passengers by 5% and rewrite the updated records into the file **PASSENGERS.DAT**.

37. मनोवैज्ञानिक उपचार और परामर्श के क्षेत्र में "स्वभाव" एक बड़ा गैर-सरकारी संगठन (NGO) है जिसका मुख्य कार्यालय नागपुर में है । वह दूसरे शहर विजयवाड़ा में इसका एक केन्द्र स्थापित करने की योजना कर रहा है । विजयवाड़ा केन्द्र में चार ब्लॉक अर्थात् प्रशासन (ADMIN), मनोचिकित्सा (PSYCHIATRY), मनोविज्ञान (PSYCHOLOGY) और आईसीयू (ICU) होंगे । एक नेटवर्क विशेषज्ञ के रूप में निम्नलिखित मानकों (parameters) को ध्यान में रखते हुए प्रश्न (i) से (v) तक में उल्लिखित मुद्दों/समस्याओं को हल करने के लिये आपको नेटवर्क संबंधी सर्वोत्तम समाधान बताना है :

5 × 1 = 5

विजयवाड़ा केन्द्र ⟶



एक ब्लॉक से दूसरे ब्लॉक की दूरी (मीटर में) :

कहाँ से	कहाँ तक	दूरी
प्रशासन (ADMIN)	मनोचिकित्सा (PSYCHIATRY)	65 मी.
प्रशासन (ADMIN)	मनोविज्ञान (PSYCHOLOGY)	65 मी.
प्रशासन (ADMIN)	आईसीयू (ICU)	65 मी.
मनोचिकित्सा (PSYCHIATRY)	मनोविज्ञान (PSYCHOLOGY)	100 मी.
मनोचिकित्सा (PSYCHIATRY)	आईसीयू (ICU)	50 मी.
मनोविज्ञान (PSYCHOLOGY)	आईसीयू (ICU)	50 मी.

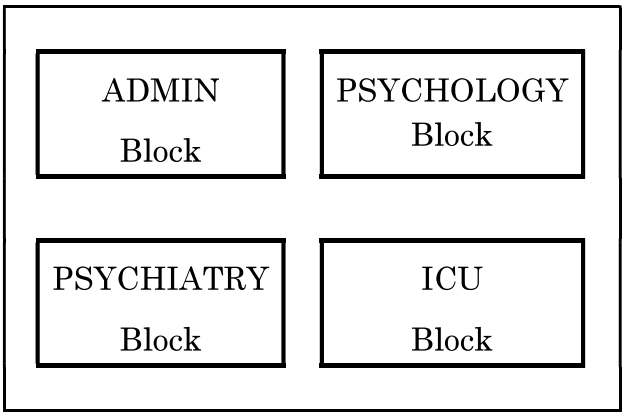
विजयवाड़ा केन्द्र से नागपुर मुख्य कार्यालय की दूरी = 700 कि.मी.

प्रत्येक ब्लॉक में कम्प्यूटर्स की संख्या इस प्रकार है :

ब्लॉक	कम्प्यूटर की संख्या
प्रशासन (ADMIN)	16
मनोचिकित्सा (PSYCHIATRY)	40
मनोविज्ञान (PSYCHOLOGY)	19
आईसीयू (ICU)	20

37. 'Swabhaav' is a big NGO working in the field of Psychological Treatment and Counselling, having its Head Office in Nagpur. It is planning to set up a center in Vijayawada. The Vijayawada Center will have four blocks – ADMIN, PSYCHIATRY, PSYCHOLOGY, and ICU. You, as a Network Expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in questions (i) to (v), keeping the following parameters in mind : **5 × 1 = 5**

Vijayawada Center ⟶



Block to Block distances (in metres) :

From	To	Distance
ADMIN	PSYCHIATRY	65 m
ADMIN	PSYCHOLOGY	65 m
ADMIN	ICU	65 m
PSYCHIATRY	PSYCHOLOGY	100 m
PSYCHIATRY	ICU	50 m
PSYCHOLOGY	ICU	50 m

Distance of Nagpur Head Office from Vijayawada Center = 700 km

Number of Computers in each block is as follows :

Block	No. of Computers
ADMIN	16
PSYCHIATRY	40
PSYCHOLOGY	19
ICU	20

(i) विजयवाड़ा केन्द्र के अंदर सर्वर (server) के लिए सर्वाधिक उपयुक्त स्थान का सुझाव दीजिए । अपने चयन का औचित्य सिद्ध कीजिए ।

(ii) विजयवाड़ा केन्द्र के प्रत्येक ब्लॉक के अन्दर सभी कम्प्यूटरों को जोड़ने के लिये आप किस हार्डवेयर उपकरण (Hardware Device) का सुझाव देंगे ?

(iii) विजयवाड़ा केन्द्र के अंदर विभिन्न ब्लॉकों को कुशलतापूर्वक जोड़ने के लिये एक केबल नक्शा (cable layout) बनाइये ।

(iv) विजयवाड़ा केन्द्र में सभी कम्प्यूटर्स को इंटरनेट प्रदान करने के लिये router को कहाँ लगाया जाना चाहिए ?

(v) (a) नागपुर के प्रबंधक विजयवाड़ा में प्रशासन ब्लॉक के कम्प्यूटर से परोक्ष रूप से (remotely) जुड़ना चाहते हैं । इसके लिये कौन सा प्रोटोकोल (protocol) प्रयोग किया जाएगा ?

अथवा

(b) विजयवाड़ा केन्द्र से जुड़े कम्प्यूटरों के बीच कौन सा नेटवर्क (PAN, LAN, MAN या WAN) स्थापित किया जाएगा ?

(i) Suggest the most appropriate location of the server inside the Vijayawada Center. Justify your choice.

(ii) Which hardware device will you suggest to connect all the computers within each block of Vijayawada Center ?

(iii) Draw a cable layout to efficiently connect various blocks within the Vijayawada Center.

(iv) Where should the router be placed to provide internet to all the computers in the Vijayawada Center ?

(v) (a) The Manager at Nagpur wants to remotely access the computer in Admin block in Vijayawada. Which protocol will be used for this ?

OR

(b) Which type of Network (PAN, LAN, MAN or WAN) will be set up among the computers connected with Vijayawada Center ?



Marking Scheme

Strictly Confidential

(For internal and restricted use only)

Senior Secondary School Examination 2025

SUBJECT NAME: COMPUTER SCIENCE SUBJECT CODE: 083 (Set 4 Q.P. CODE 91)

General Instructions:		
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.	
2	"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to the public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc. may invite action under various rules of the Board and IPC."	
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand the given answer and even if the reply is not from the marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.	
4	The Marking Scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.	
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.	
6	Evaluators will mark(√) wherever the answer is correct. For wrong answer CROSS 'X" be marked. Evaluators will not put right (✓)while evaluating which gives an impression that the answer is correct and no marks are awarded. This is the most common mistake which evaluators are committing.	
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.	
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.	
9	If a student has attempted an extra question, the answer of the question deserving more marks should be retained and the other answer scored out with a note "Extra Question".	

10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.	
11	A full scale of marks **70 marks** has to be used. Please do not hesitate to award full marks if the answer deserves it.	
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.	
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- ● Leaving the answer or part thereof unassessed in an answer book. ● Giving more marks for an answer than assigned to it. ● Wrong totaling of marks awarded on an answer. ● Wrong transfer of marks from the inside pages of the answer book to the title page. ● Wrong question wise totaling on the title page. ● Wrong totaling of marks of the two columns on the title page. ● Wrong grand total. ● Marks in words and figures not tallying/not same. ● Wrong transfer of marks from the answer book to online award list. ● Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answers.) ● Half or a part of the answer marked correct and the rest as wrong, but no marks awarded.	
14	While evaluating the answer books, if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.	
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.	
16	The Examiners should acquaint themselves with the guidelines given in the “Guidelines for Spot Evaluation” before starting the actual evaluation.	
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.	
18	The candidates are entitled to obtain a photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.	

MARKING SCHEME
COMPUTER SCIENCE 083

Max. Marks: 70

General Instructions :

(i) *This question paper contains 37 questions.*

(ii) ***All** questions are **compulsory**. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.*

(iii) *The paper is divided into 5 Sections - **A, B, C, D, E**.*

(iv) ***Section A**, consists of **21** questions (1 to 21). Each question carries **1** mark.*

(v) ***Section B**, consists of **7** questions (22 to 28). Each question carries **2** marks.*

(vi) ***Section C**, consists of **3** questions (29 to 31). Each question carries 3 marks.*

(vii) ***Section D**, consists of **4** questions (32 to 35). Each question carries 4 marks.*

(viii) ***Section E**, consists of **2** questions (36 & 37). Each question carries 5 marks.*

(ix) *All programming questions are to be answered using Python Language only.*

(x) *In case of MCQs, text of the correct answer should also be written*

Specific Instructions:

- The answers given in the marking scheme are SUGGESTIVE. Examiners are requested to award marks for all alternative correct Solutions/Answers conveying a similar meaning
- All programming questions have to be answered with respect to Python only
- In Python, ignore case sensitivity for identifiers (Variable / Functions / Structures / Class Names)
- In Python indentation is mandatory, however, the number of spaces used for indenting may vary
- In SQL related questions – both ways of text/character entries should be acceptable for Example: "AMAR" and 'amar' both are acceptable.
- In SQL related questions – all date entries should be acceptable for Example: 'YYYY-MM-DD', 'YY-MM-DD', 'DD-Mon-YY', "DD/MM/YY", 'DD/MM/YY', "MM/DD/YY", 'MM/DD/YY' and {MM/DD/YY} are correct.
- In SQL related questions – semicolon should be ignored for terminating the SQL statements
- In SQL related questions – ignore case sensitivity
- In SQL output questions – ignore the column headers
- In SQL output questions – ignore the order of rows until **`ORDER BY`** is specified

SECTION A		**(21x1=21)**
1.	State True or False: "A Python List must always contain all its elements of same data type."	1
Ans	False	
	(1 Mark for writing the correct answer)	

2.	What will be the output of the following statement? `print(14%3**2*4)` (A) `16` (B) 64 (C) `20` (D) 256	1
Ans	(C) `20`	
	(1 Mark for writing the correct option)	

3.	Identify the correct output of the following code snippet:
	`game="Olympic2024"`
	`print(game.index("C"))`
	(A) `0` (B) `6`
	(C) `-1` (D) `ValueError`
		1

Ans	(D) `ValueError`	
	(1 Mark for writing the correct option)	
4.	Which of the following is the correct identifier? (A) `global` (B) `Break` (C) `def` (D) `with`	1
Ans	**(B)** `Break`	
	(1 Mark for writing the correct option)	
5.	Identify the invalid Python statement out of the following options: (A) `print("A",10,end="*")` (B) `print("A",sep="*",10)` (C) `print("A",10,sep="*")` (D) `print("A"*10)`	1
Ans	**(B)** `print("A",sep="*",10)`	
	(1 Mark for writing the correct option)	

6.	Consider the statements given below and then choose the correct output from the given options:
	`L=['TIC', 'TAC']`
	`print(L[::-1])`
	(A) `['CIT', 'CAT']` (B) `['TIC', 'TAC']`
	(C) `['CAT', 'CIT']` (D) `['TAC', 'TIC']`
		1

Ans	**(D)** `['TAC', 'TIC']`	
	(1 Mark for writing the correct option)	
7.	Which of the following operator evaluates to `True` if the variable on either side of the operator points towards the same memory location and `False` otherwise? (A) `is` (B) `is not` (C) `and` (D) `or`	1

Ans	(A) **is**	
	(1 Mark for writing the correct option)	

8.	Consider the statements given below and then choose the correct output from the given options:
	`D={'S01':95, 'S02':96 }`
	`for I in D:`
	`  print(I,end='#')`
	(A) **S01#S02#** (B) **95#96#**
	(C) **S01,95#S02,96#** (D) **S01#95#S02#96#**
		1

Ans	(A) **S01#S02#**	
	(1 Mark for writing the correct option)	
9.	While creating a table, which constraint does not allow insertion of duplicate values in the table ? (A) **UNIQUE** (B) **DISTINCT** (C) **NOT NULL** (D) **HAVING**	1
Ans	**(A) UNIQUE**	
	(1 Mark for writing the correct option)	

10.	Consider the statements given below and then choose the correct output from the given options:
	`def Change(N):`
	`  N=N+10`
	`  print(N,end='$$')`
	`N=15`
	`Change(N)`
	`print(N)`
	(A) **25$$15** (B) **15$$25**
	(C) **25$$25** (D) **2525$$**
		1

Ans	(A) **25$$15**	
	(1 Mark for writing the correct option)	

11.	Consider the statements given below and then choose the correct output from the given options:
	`N='5'`
	`try:`
	`  print('WORD' + N, end='#')`
	`except:`
	`  print('ERROR',end='#')`
	`finally:`
	`  print('OVER')`
	(A) **ERROR#** (B) **WORD5#OVER**
	(C) **WORD5#** (D) **ERROR#OVER**
		1

Ans	(B) **WORD5#OVER**	
	(1 Mark for writing the correct option)	
12.	Which of the following built-in function/method returns a dictionary ? (A) **dict()** (B) **keys()** (C) **values()** (D) **items()**	1
Ans	(A) **dict()**	
	(1 Mark for writing the correct option)	
13.	Which of the following is a DML command in SQL ? (A) **UPDATE** (B) **CREATE** (C) **ALTER** (D) **DROP**	1
Ans	(A) **UPDATE**	
	(1 Mark for writing the correct option)	
14.	Which aggregate function in SQL displays the number of values in the specified column ignoring the NULL values ? (A) **len()** (B) **count()** (C) **number()** (D) **num()**	1
Ans	(B) **count()**	
	(1 Mark for writing the correct option)	
15.	In MYSQL, which type of value should not be enclosed within quotation marks ? (A) **DATE** (B) **VARCHAR** (C) **FLOAT** (D) **CHAR**	1
Ans	(C) **FLOAT**	
	(1 Mark for writing the correct option)	

16.	State True or False : If table **A** has 6 rows and 3 columns, and table **B** has 5 rows and 2 columns, the Cartesian product of **A** and **B** will have 30 rows and 5 columns.	1
Ans	**`True`**	
	(1 Mark for writing the correct answer)	
17.	Which of the following networking devices is used to regenerate and transmit the weakened signal ahead? (A) **`Hub`** (B) **`Ethernet Card`** (C) **`Repeater`** (D) **`Modem`**	1
Ans	(C) **`Repeater`**	
	(1 Mark for writing the correct option)	
18.	Which of the following options is the correct protocol used for phone calls over the Internet? (A) **`PPP`** (B) **`FTP`** (C) **`HTTP`** (D) **`VoIP`**	1
Ans	(D) **`VoIP`**	
	(1 Mark for writing the correct option)	
19.	Expand ARPANET.	1
Ans	Advanced Research Projects Agency Network	
	(Full 1 Mark for writing the the correct full form) **OR** ***(½ Mark for writing any two correct expanded terms)***	
	Q.Nos. **20** and **21** are Assertion (A) and Reason (R) based questions. Mark the correct choice as (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation for Assertion (A). (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A). (C) Assertion (A) is true but, Reason (R) is false. (D) Assertion (A) is false but, Reason (R) is true.	
20.	**Assertion (A):** For a binary file opened using **`'rb'`** mode, the **`pickle.dump()`** method will display an error. **Reason (R):** The **`pickle.dump()`** method is used to read from a binary file.	1
Ans	(C) Assertion (A) is true, but Reason (R) is false.	
	(1 Mark for writing the correct option)	
21.	**Assertion (A) :** We can retrieve records from more than one table in MYSQL. **Reason (R) :** Foreign key is used to establish a relationship between two tables.	1

Ans	(B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A).	
	(1 Mark for writing the correct option)	

	SECTION B	**(7x2=14)**
22.	What does the **`return`** statement do in a function ? Explain with the help of an example.	2

Ans	The return statement in Python is used to exit a function and return a value to the caller.
	Example :
	`def Add(A, B):`
	`  return A+B`
	`Result=Add(5,3)`
	`print(Result)`
	
	`Output:`
	`8`	

	(1 Mark for writing the correct explanation) ***(1 Mark for writing the correct example)*** **OR** ***(Full 2 Marks for correct explanation with the help of a suitable example)***	
23.	Write one example of each of the following in Python : (i) Syntax Error (ii) Implicit Type conversion	2

Ans	**(i) Syntax Error**
	`print(2 ; 5)`
	
	(ii) Implicit Type conversion
	`x=10`
	`y=20.5`
	`print(x+y)`
	Note:
	● The above examples are just suggestive. Accept all correct examples	

	(1 Mark for writing each correct example)	

24.	Consider the following dictionaries, D and D1 :
	`D={"Suman": 40, "Raj":55, "Raman":60}`
	`D1={"Aditi":30, "Amit":90,"Raj":20}`
	(Answer using built-in Python functions only)
	(i) (a) Write a statement to display/return the value corresponding to the key `"Raj"` in the dictionary **D**.
	OR
	(b) Write a statement to display the length of the dictionary `D1`.
	(ii) (a) Write a statement to append all the key-value pairs of the dictionary `D` to the dictionary `D1`.
		2

	OR (b) Write a statement to delete the item with the given key **"Amit"** from the dictionary **D1.**	
Ans	(i) (a) **D.get("Raj") # OR D["Raj"] may also be considered** **OR** (b) **len(D1) # OR len(D1.items())** **# OR len(D1.keys())** **# OR len(D1.values())** (ii) (a) **D1.update(D)** **OR** (b) **D1.pop("Amit") # OR del D1["Amit"]** **# may also be considered**	
	(i) (1 Mark for writing the correct statement) ***(ii) (1 Mark for writing the correct statement)***	
25.	What possible output from the given options is expected to be displayed when the following code is executed? **import random** **Cards=["Heart","Spade","Club","Diamond"]** **for i in range(2):** **print(Cards[random.randint(1,i+2)],end="#")** (A) **Spade#Diamond#** (B) **Spade#Heart#** (C) **Diamond#Club#** (D) **Heart#Spade#**	2
Ans	**(A) Spade#Diamond#**	
	(2 Marks for writing the correct option)	
26.	The code given below accepts N as an integer argument and returns the sum of all integers from 1 to N. Observe the following code carefully and rewrite it after removing all syntax and logical errors. Underline all the corrections made. **def Sum(N)** **for I in range(N):** **S=S+I** **return S** **print(Sum(10)**	2
Ans	**def Sum(N):** **S=N** **for I in range(N):** **S=S+I** **return S** **print(Sum(10))** **OR**	

	`def Sum(N):`
	`  S=0`
	`  for I in range(1,N+1): # OR  for I in range(N+1):`
	`  S=S+I`
	`  return S`
	`print(Sum(10))`	

	(Full 2 Marks for writing all required corrections) *OR* *(½ Mark for writing the : after* `def Sum(N)` *)* *(½ Mark for correctly initialising* `S`*)* *(½ Mark for calculating the correct/required sum* `S`*)* *(½ Mark for writing the '*`)`*' at the end of* `print(Sum(10) )` *OR* *(1 Mark for only identification of all/any three errors without correction)*	
27.	Nisha is assigned the task of maintaining the staff data of an organization. She has to store the details of the staff in the SQL table named **`EMPLOYEES`** with attributes as **`EMPNO`**, **`NAME`**, **`DEPARTMENT`**, **`BASICSAL`** to store Employee's Identification Number, Name, Department and Basic Salary respectively. There can be two or more Employees with the same name in the organization. (i) (a) Help Nisha to identify the attribute which should be designated as the **PRIMARY KEY**. Justify your anwer. **OR** (b) Help Nisha to identify the constraint which should be applied to the attribute **`NAME`** such that the Employees' Names cannot be left empty or **NULL** while entering the records but can have duplicate values.	2
Ans	(i) **(a)** **`EMPNO`** (i) Employee's Identification Number always contains unique and not null values. (ii) Other attributes may have duplicate values (assuming 2 or more employees may have same Name, Department or Basic Salary) and an attribute with possible duplicate values can not be considered as the Primary Key. *(Any one valid justification)* **OR** **(b)** **`NOT NULL`**	
	(i) (a) ***(½ Mark for suggesting the correct attribute for PRIMARY KEY)*** ***(½ Mark for any one valid justification)***	

	OR ***(i) (b)*** ***(1 Mark for writing the correct constraint for attribute NAME)***	
	(ii) (a) Write the **SQL** command to change the size of the attribute **`BASICSAL`** in the table **`EMPLOYEES`** to allow the maximum value of **`99999.99`** to be stored in it. **OR** (b) Write the SQL command to delete the table **`EMPLOYEES`**	
Ans	(ii) **(a)** **`ALTER TABLE EMPLOYEES`** **`MODIFY COLUMN BASICSAL FLOAT(7,2);`** **`# OR DECIMAL(7,2)`** **OR** **(b)** **`DROP TABLE EMPLOYEES;`**	
	(a) ***(½ Mark for writing*** **`ALTER TABLE EMPLOYEES)`** ***(½ Mark for correctly writing remaining part of the command)*** ***OR*** **(b)** ***(1 Mark for writing*** **`DROP TABLE EMPLOYEES`** **correctly*)*** ***OR*** ***(½ Mark for writing*** **`DROP TABLE`** ***only)***	
28.	**(a)** Expand and explain the term **URL.** **OR** **(b)** Expand the term PPP. What is the use of **PPP**?	2
Ans	**(a)** URL (Uniform Resource Locator) : It is the unique address of any resource on the Internet. **OR** **(b)** PPP (Point to Point Protocol) : This protocol is used to establish a dedicated and direct connection between two communicating devices.	
	(a) ***(1 Mark for writing correct explanation)*** ***(1 Mark for writing correct expansion)*** ***OR*** ***(½ Mark for writing any two words of correct expansion)*** **OR** **(b)** ***(1 Mark for writing correct expansion)*** ***(1 Mark for writing correct use)*** ***OR*** ***(½ Mark for writing any two words of correct expansion)***	

SECTION C		(3x3=9)
29.	(a) Write a Python function that displays all the lines containing the word `'vote'` from a text file `"Elections.txt"`. For example, if the file contains : ***In an election many people vote to choose their representative.*** ***The candidate getting the maximum share of votes stands elected.*** ***Normally, one person has to vote once.*** ***The process of voting may vary with time and region.*** Then the output should be : ***In an election many people vote to choose their representative.*** ***Normally, one person has to vote once.***	3
Ans	**def PrintVote():** **F=open("Elections.txt")** **Lines=F.readlines()** **for Line in Lines:** **L=Line.split()** **if "vote" in L:** **print(Line)** **F.close()** **OR** **def PrintVote():** **with open("Elections.txt") as F:** **Lines=F.readlines()** **for Line in Lines:** **L=Line.split()** **if "vote" in L:** **print(Line)** **OR** **def PrintVote():** **F=open("Elections.txt")** **while True:** **Line=F.readline()** **if Line!="":** **if "vote" in Line.split():** **print(Line)** **else:** **break** **F.close()** **OR** **Any other equivalent correct code**	
	(½ Mark for opening the file in default/correct mode) ***(½ Mark for correct reading & iteration)*** ***(½ Mark for correct logic of extracting the word `'vote'`)*** ***(1 Mark for correct condition)*** ***(½ Mark for displaying line)***	
	OR	

(b) Write a Python function that displays all the words starting and ending with a vowel from a text file "**Report.txt**". The consecutive words should be separated by a space in the output. For example, if the file contains :

Once there was a wise man in a village.
He was an awesome story-teller.
He was able to keep people anchored while listening to him.

Then the output should be :
Once a a awesome able

Ans

```
def vowels():
  F=open('Report.txt')
  Data=F.read()
  Words=Data.split()
  for Word in Words:
     if Word[0] in 'aeiouAEIOU':
        if Word[-1] in 'aeiouAEIOU':
            print(Word,end=' ')
  F.close()
```

OR

```
def vowels():
  with open('Report.txt') as F:
    Data=F.read()
    Words=Data.split()
    for Word in Words:
      if Word[0].upper() in 'AEIOU'
         and Word[-1].upper() in 'AEIOU':
           print(Word,end=' ')
```

OR

Any other equivalent correct code

(½ Mark for opening the file in default/correct mode)
(½ Mark for correct reading & iteration)
(½ Mark for correct logic to process each word)
(1 Mark for correct condition)
(½ Mark for displaying word)

30. (a) A stack, named **ClrStack**, contains records of some colors. Each record is represented as a tuple containing four elements – **ColorName, RED, GREEN, BLUE**. **ColorName** is a string, and **RED, GREEN, BLUE** are integers. For example, a record in the stack may be **('Yellow', 237, 250, 68)**
Write the following user-defined functions in Python to perform the specified operations on **ClrStack**:

(i)	**push_Clr(ClrStack, new_Clr)**: This function takes the stack **ClrStack** and a new record **new_Clr** as arguments and pushes this new record onto the stack.

3x1 =3

		(ii)	**pop_Clr(ClrStack):** This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display the message **"Underflow"**.	
		(iii)	**isEmpty(ClrStack):** This function checks whether the stack is empty. If the stack is empty, the function should return **True**, otherwise the function should return **False**.	
Ans				

(i)

```
def push_Clr(ClrStack, new_Clr):
  ClrStack.append(new_Clr)
```

(ii)

```
def pop_Clr(ClrStack):
  if len(ClrStack) == 0:
  # OR if not ClrStack:
  # OR if ClrStack == []:
    print("Underflow")
  else:
    return(ClrStack.pop())
```

(iii)

```
def isEmpty(ClrStack):
  if len(ClrStack) == 0:
  # OR if not ClrStack:
  # OR if ClrStack == []:
    return True
  else:
    return False
```

(i)
(1 Mark for correct definition of **`push_Clr(ClrStack, new_Clr)`** ***)***

(ii)
(½ Mark for correctly checking and displaying "Underflow")
(½ Mark for correctly popping and returning popped tuple/data)

(iii)
(½ Mark for correctly checking whether the Stack is Empty or not)
(½ Mark for correctly returning/printing the required values)

OR

(b) Write the following user-defined functions in Python :

(i) **push_trail(N,myStack)**: Here N and **myStack** are lists, and **myStack** represents a stack. The function should push the last **5** elements from the list **N** onto the stack **myStack**. For example, if the list **N** is **[1,2,3,4,5,6,7]**, then the function **push_trail()** should push the elements **3,4,5,6,7** onto the stack. Therefore the value of stack will be **[3,4,5,6,7]**.

Assume that **N** contains at least **5** elements.

	(ii)	**pop_one(myStack):** The function should pop an element from the stack **myStack**, and return this element. If the stack is empty, then the function should display the message **'Stack Underflow'**, and return **None**.	
	(iii)	**display_all(myStack):** The function should display all the elements of the stack **myStack**, without deleting them. If the stack is empty, the function should display the message **'Empty Stack'**.	

Ans (b)

(i)

```
def push_trail(N,myStack):
  for i in range(-5,0,1): # Any other correct loop
    myStack.append(N[i])
```

(ii)

```
def pop_one(myStack):
  if not myStack:  #OR if myStack==[]:
                   #OR if len(myStack)==0:
    print('Stack Underflow')
  else:
    return myStack.pop()
```

(iii)

```
def display_all(myStack):
  if not myStack:  #OR if myStack==[]:
                   #OR if len(myStack)==0:
    print("Empty Stack")
  else:
    for i in myStack[::-1]: # print(myStack[::-1])
      print(i,end=' ')      # -
```

(i)

(1 Mark for correct definition of **push_trail(N,myStack)***)*

(ii)

(½ Mark for correctly checking and displaying "Stack Underflow")
(½ Mark for correctly popping and returning last element)

(iii)

(½ Mark correctly checking Empty condition)
(½ Mark correctly displaying content till the last value in the stack)

31. (a) Predict the output of the following code : 3

```
def ExamOn(mystr) :
  newstr = ""
  count = 0
  for i in mystr:
    if count%2 != 0:
      newstr = newstr + str(count-1)
    else:
      newstr = newstr + i.lower()
    count += 1
```

	`newstr = newstr + mystr[:2]`
	`print("The new string is:", newstr)`
	`ExamOn("GenX")`	

Ans	`The new string is: g0n2Ge`	
	(½ Mark for each correct letter/digit in the right order) ***Note:*** ***(2½ Marks only to be awarded, if all the parts of*** `g0n2Ge is` ***written correctly without the text '***`The new string is:`***')***	

	OR
	(b) Write the output on execution of the following Python code:
	`def Change(X):`
	`for K,V in X.items():`
	`L1.append(K)`
	`L2.append(V)`
	`D={1:"ONE",2:"TWO",3:"THREE"}`
	`L1=[]`
	`L2=[]`
	`Change(D)`
	`print(L1)`
	`print(L2)`
	`print(D)`	

Ans	**Note: Considering two lines after the for loop indented**
	`[1, 2, 3]`
	`['ONE', 'TWO', 'THREE']`
	`{1: 'ONE', 2: 'TWO', 3: 'THREE'}`
	
	OR
	Note: Considering only first line after the for loop to be indented
	`[1, 2, 3]`
	`['THREE']`
	`{1: 'ONE', 2: 'TWO', 3: 'THREE'}`	

	(1 Mark for writing each correct line of output) ***OR*** ***(Full 3 Marks for writing indentation error)***	

	SECTION D	**(4x4=16)**
32.	Suman has created a table named **WORKER** with a set of records to maintain the data of the construction sites, which consists of **WID**, **WNAME**, **WAGE**, **HOURS**, **TYPE**, and **SITEID**. After creating the table, she entered data in it, which is as follows :	4

WID	WNAME	WAGE	HOURS	TYPE	SITEID
W01	Ahmed J	1500	200	Unskilled	103
W11	Naveen S	520	100	Skilled	101
W02	Jacob B	780	95	Unskilled	101
W15	Nihal K	560	110	Semiskilled	NULL
W10	Anju S	1200	130	Skilled	103

(a) Based on the data given above, answer the following questions :

(i) Write the SQL statement to display the names and wages of those workers whose wages are between 800 and 1500.

Ans

```
SELECT WNAME, WAGE FROM WORKER
WHERE WAGE BETWEEN 800 AND 1500;
```

OR

```
SELECT WNAME, WAGE FROM WORKER
WHERE WAGE>=800 AND WAGE<=1500;
```

(½ Mark for correctly writing `SELECT WNAME, WAGE FROM WORKER`)
(½ Mark for correctly writing `WHERE WAGE BETWEEN 800 AND 1500`)

(ii) Write the SQL statement to display the record of workers whose **SITEID** is not known.

Ans

```
SELECT * FROM WORKER
WHERE SITEID IS NULL;
```

(½ Mark for correctly writing `SELECT * FROM WORKER` or Equivalent)
(½ Mark for correctly writing `WHERE SITEID IS NULL`)

(iii) Write the SQL statement to display **WNAME, WAGE** and **HOURS** of all those workers whose **TYPE** is **'Skilled'**.

Ans

```
SELECT WNAME, WAGE, HOURS FROM WORKER
WHERE TYPE="Skilled";
```

(½ Mark for writing `SELECT WNAME, WAGE, HOURS FROM WORKER`)
(½ Mark for writing `WHERE TYPE = "Skilled"`)

(iv) Write the SQL statement to change the **WAGE** to 1200 of the workers where the **TYPE** is "Semiskilled"

Ans

```
UPDATE WORKER SET WAGE=1200
WHERE TYPE="Semiskilled";
```

	(½ Mark for writing ***UPDATE WORKER SET WAGE=1200****)* *(½ Mark for writing* ***WHERE TYPE = "Semiskilled"****)*	
	OR (b) Considering the above given table **WORKER**, write the output on execution of the following SQL commands:	
	(i) **SELECT WNAME, WAGE*HOURS FROM WORKER WHERE SITEID = 103;**	
Ans	<table><tr><th>WNAME</th><th>WAGE*HOURS</th></tr><tr><td>Ahmed J</td><td>300000</td></tr><tr><td>Anju S</td><td>156000</td></tr></table>	
	(1 Mark for writing correct output)	
	(ii) **SELECT COUNT(DISTINCT TYPE) FROM WORKER ;**	
Ans	<table><tr><th>COUNT(DISTINCT TYPE)</th></tr><tr><td>3</td></tr></table>	
	(1 Mark for writing correct output)	
	(iii) **SELECT MAX(WAGE), MIN(WAGE), TYPE FROM WORKER GROUP BY TYPE;**	
Ans	<table><tr><th>MAX(WAGE)</th><th>MIN(WAGE)</th><th>TYPE</th></tr><tr><td>1500</td><td>780</td><td>Unskilled</td></tr><tr><td>1200</td><td>520</td><td>Skilled</td></tr><tr><td>560</td><td>560</td><td>Semiskilled</td></tr></table>	
	(1 Mark for writing correct output)	
	(iv) **SELECT WNAME, SITEID FROM WORKER WHERE TYPE="Unskilled" ORDER BY HOURS;**	
Ans	<table><tr><th>WNAME</th><th>SITEID</th></tr><tr><td>Jacob B</td><td>101</td></tr><tr><td>Ahmed J</td><td>103</td></tr></table>	
	(1 Mark for writing correct output)	
33.	A csv file "**P_record.csv**" contains the records of patients in a hospital. Each record of the file contains the following data : ● Name of a patient ● Disease ● Number of days patient is admitted ● Amount	4

For example, a sample record of the file may be :

["Gunjan","Jaundice",4,15000]

Write the following Python functions to perform the specified operations on this file :

(i) Write a function **read_data()** which reads all the data from the file and displays the details of all the **'Cancer'** patients.

(ii) Write a function **count_rec()** which counts and returns the number of records in the file.

Ans **(i)**

```
import csv
def read_data():
  F=open("P_record.csv","r")
  Records=list(csv.reader(F))
  for R in Records :
    if R[1]=="Cancer":
      print(R)
  F.close()
```

(ii)

```
def count_rec():
  with open("P_record.csv","r") as F:
    Records=list(csv.reader(F))
    print(len(Records))
```

(i)

(½ Mark for opening the csv file in correct mode)
(½ Mark for reading the records from csv file)
(½ Mark for iteration of records)
(½ Mark for checking and displaying the matched records correctly)

(ii)

(½ Mark for opening the csv file in correct mode)
(½ Mark for reading the records from csv file)
(1 Mark for finding/counting & displaying the number of records)

34. Assume that you are working in the IT Department of a Creative Art Gallery (CAG), which sells different forms of art creations like Paintings, Sculptures etc. The data of Art Creations and Artists are kept in tables **Articles** and **Artists** respectively. Following are few records from these two tables : 4x1 =4

Table : Articles

Code	A_Code	Article	DOC	Price
PL001	A0001	Painting	2018-10-19	20000
SC028	A0004	Sculpture	2021-01-15	16000
QL005	A0003	Quilling	2024-04-24	3000

Table : Artists

A_Code	Name	Phone	Email	DOB
A0001	Roy	595923	r@CrAG.com	1986-10-12
A0002	Ghosh	1122334	ghosh@CrAG.com	1972-02-05
A0003	Gargi	121212	Gargi@CrAG.com	1996-03-22
A0004	Mustafa	33333333	Mf@CrAg.com	2000-01-01

Note :

- The tables contain many more records than shown here.
- DOC is Date of Creation of an Article.

As an employee of CAG, you are required to write the SQL queries for the following :

(i) To display all the records from the **Articles** table in descending order of price.

(ii) To display the details of Articles which were created in the year **2020**.

(iii) To display the structure of **Artists** table.

(iv) (a) To display the name of all Artists whose Article is **Painting** through Equi Join.

OR

(b) To display the name of all Artists whose Article is '**Painting**' through Natural Join.

Ans

(i)
```
SELECT * FROM Articles
ORDER BY PRICE DESC;
```

(½ Mark for ***SELECT * FROM Articles*** *or similar)*
(½ Mark for **ORDER BY PRICE DESC***)*

(ii)
```
SELECT * FROM Articles
 WHERE DOC LIKE '2020%';
 OR
SELECT * FROM Articles
 WHERE DOC>='2020-01-01' AND DOC<='2020-12-31';
 OR
SELECT * FROM Articles
 WHERE DOC BETWEEN '2020-01-01' AND '2020-12-31';
```

(½ Mark for **SELECT * FROM Articles** *or similar)*
(½ Mark for **WHERE DOC LIKE '2020%'** *OR any other correct equivalent)*

(iii)
```
DESC Artists;
```

	(½ Mark for **DESC***)* *(½ Mark for mentioning Artists after* ***DESC****)*	
	(iv) (a) **SELECT Name FROM Articles A1, Artists A2** **WHERE A1.A_code = A2.A_code AND Article='Painting';** **OR** **Any other equivalent SQL statement**	
	(½ Mark for **SELECT Name FROM Articles A1, Artists A2** *or similar)* *(½ Mark for* **WHERE A1.A_code = A2.A_code AND Article='Painting';***)*	
	OR (b) **SELECT Name FROM Articles NATURAL JOIN Artists** **WHERE Article = 'Painting';** **OR** **Any other equivalent SQL statement**	
	(½ Mark for selecting from both the tables) *(½ Mark for correctly using condition/correctly using join option)*	
35.	A table, named **THEATRE,** in **CINEMA** database, has the following structure : **Fields** / **Type** **Th_ID** / **char(5)** **Name** / **varchar(15)** **City** / **varchar(15)** **Location** / **varchar(15)** **Seats** / **int** Write a function **Delete_Theatre()**, to input the value of **Th_ID** from the user and permanently delete the corresponding record from the table. Assume the following for Python-Database connectivity : Host : **localhost**, User : **root**, Password : **Ex2025**	4
Ans	**import pymysql as pm # OR import mysql.connector as pm** **def Delete_Theatre():** **Mydb=pm.connect(host = 'localhost',** **user = 'root', password = 'Ex2025', database = 'CINEMA')** **MyCursor = Mydb.cursor()** **TID = input("Theatre ID:")** **Query = "DELETE FROM Theatre WHERE Th_ID='{}'".format(TID)** **# Query = f"DELETE FROM Theatre WHERE Th_ID='{TID}'"** **# Query = "DELETE FROM Theatre WHERE Th_ID='%s'"%(TID,)** **# Query = "DELETE FROM Theatre WHERE Th_ID='"+TID+"'"** **MyCursor.execute(Query)** **Mydb.commit()** **Mydb.close()**	

OR

```
import pymysql as pm    # OR import mysql.connector as pm
def Delete_Theatre():
  Mydb=pm.connect(host = 'localhost',
  user = 'root', password = 'Ex2025', database = 'CINEMA')
  MyCursor = Mydb.cursor()
  TID = input("Theatre ID:")
  Query = "DELETE FROM Theatre WHERE Th_ID=%s"
  Data=(TID,)
  MyCursor.execute(Query, Data)
  Mydb.commit()
  Mydb.close()
```

OR

any equivalent valid code

(1 Mark for creating correct connectivity)
(1 Mark for creating the cursor)
(1 Mark for correct formation of Query)
(½ Mark for correct execution of the query)
(½ Mark for correctly using commit())

Note:
(½ Mark for importing correct module, if the marks allocated are less than 4)

SECTION E **(2x5=10)**

36. A file, **PASSENGERS.DAT,** stores the records of passengers using the following structure : **5**

[PNR, PName, BRDSTN, DESTN, FARE]

where :

PNR – **Passenger Number (string type)**
PName – **Passenger Name (string type)**
BRDSTN – **Boarding Station Name (string type)**
DESTN – **Destination Station Name (string type)**
FARE – **Fare amount for the journey (float type)**

Write user defined functions in Python for the following tasks :

(i) **Create()** – to input data for passengers and write it in the binary file **PASSENGERS.DAT**.

(ii) **SearchDestn(D)** -to read contents from the file **PASSENGERS.DAT** and display the details of those Passengers whose **DESTN** matches with the value of D.

(iii) **UpdateFare()** - to increase the fare of all passengers by 5% and rewrite the updated records into the file **PASSENGERS.DAT**.

Ans

(i)

```
import pickle
def Create():
    F=open("PASSENGERS.DAT", "wb")
    PNR=input("PNR No:")
    PName=input("Name: ")
    BRDSTN=input("Boarding at: ")
    DESTN=input("Destination: ")
    FARE=float(input("Fare: "))
    Rec=[PNR,PName,BRDSTN,DESTN,FARE]
    pickle.dump(Rec,F)
    F.close()
```

OR

```
def Create():
    F=open("PASSENGERS.DAT", "wb")
    REC=[]
    while True:
        PNR=input("PNR No:")
        PName=input("Name: ")
        BRDSTN=input("Boarding at: ")
        DESTN=input("Destination: ")
        FARE=float(input("Fare: "))
        Rec.append([PNR,PName,BRDSTN,DESTN,FARE])
        C=input("More(Y/N)?")
        if C =='N':
            break
    pickle.dump(Rec,F)
    F.close()
```

OR

Any other equivalent code

(ii)

```
def SearchDestn(D):
    try:                          # To be ignored
        F=open("PASSENGERS.DAT", "rb")
        Rec=pickle.load(F)
        for R in Rec:
            if R[3]==D;
                print(R)
        F.close()
    except:                       # To be ignored
        print("File not found!") # To be ignored
```

OR

```
def SearchDestn(D):
    F=open("PASSENGERS.DAT", "rb")
    try:
        while True:
            Rec=pickle.load(F)
            if Rec[3]==D;
                print(Rec)
```

```
      except EOFError:
        print("EOF reached")
      F.close()
```

(iii)

```
  def UpdateFare():
      try:
        FR=open("PASSENGERS.DAT", "rb+")
        Rec=pickle.load(FR)
        for I in range(len(Rec)):
          Rec[I][4]+=(Rec[I][4] * 0.05)
          # Rec[I][4]=Rec[I][4] * 1.05)
        print("Updation Done!")
        F.seek(0)
        pickle.dump(Rec, FR)
        FR.Close()
      except:
        print("File not found!")
```

OR

```
    def UpdateFare():
      FR=open("PASSENGERS.DAT", "rb")
      Rec=[]
      try:
        while True:
          R=pickle.load(FR)
          Rec.append(R)
      except:
        FR.close()
      for I in range(len(Rec)):
        Rec[I][4] = Rec[I][4] + (Rec[I][4] * 0.05)
        # Rec[I][4]=Rec[I][4] * 1.05)
      FP=open("PASSENGERS.DAT", "wb")
      pickle.dump(Rec, FP)
      FP.Close()
```

OR

Any other equivalent code

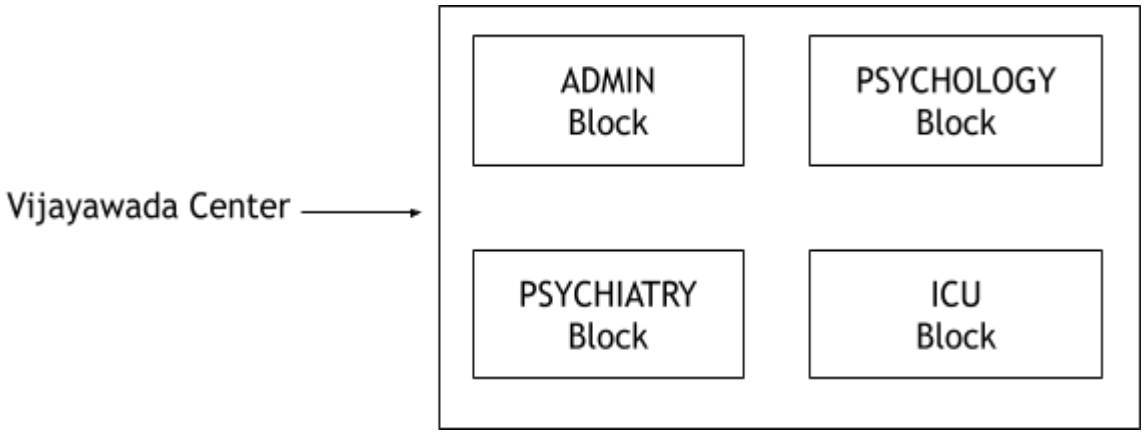
(i)

(½ Mark for opening the file in correct mode)
(½ Mark for accepting from user/writing on file)

(ii)

(½ Mark for opening the file in correct mode)
(½ Mark for reading each record)
(½ Mark for correctly checking the condition)
(½ Mark for correctly printing the details of passengers)

	(iii) ***(½ Mark for opening the file in correct mode)*** ***(½ Mark for reading data)*** ***(½ Mark for correctly modifying the Fare)*** ***(½ Mark for writing the modified Fare in the Binary File)***	
37.	'Swabhaav' is a big NGO working in the field of Psychological Treatment and Counselling, having its Head Office in Nagpur. It is planning to set up a center in Vijayawada. The Vijayawada Center will have four blocks –ADMIN, PSYCHIATRY, PSYCHOLOGY, and ICU. You, as a Network Expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in questions (i) to (v), keeping the following parameters in mind :	**5x1 =5**



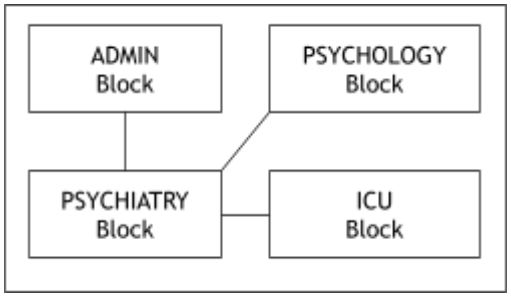
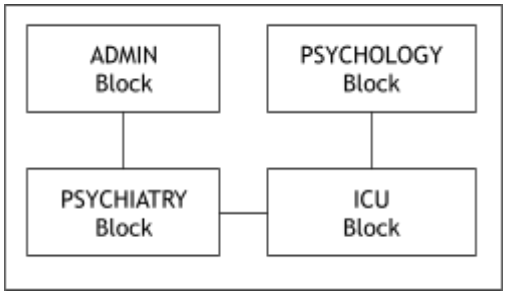
Block to Block distances (in metres) :

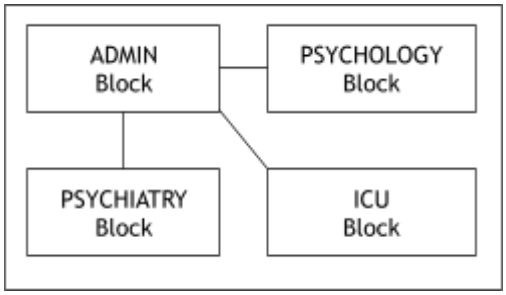
From	To	Distance
ADMIN	PSYCHIATRY	65 m
ADMIN	PSYCHOLOGY	65 m
ADMIN	ICU	65 m
PSYCHIATRY	PSYCHOLOGY	100 m
PSYCHIATRY	ICU	50 m
PSYCHOLOGY	ICU	50 m

Distance of Nagpur Head Office from Vijayawada Center = 700 km

Number of Computers in each block is as follows :

Block	No. of Computers
ADMIN	16
PSYCHIATRY	40
PSYCHOLOGY	19
ICU	20

		(i) Suggest the most appropriate location of the server inside the Vijayawada Center. Justify your choice. (ii) Which hardware device will you suggest to connect all the computers within each block of Vijayawada Center ? (iii) Draw a cable layout to efficiently connect various blocks within the Vijayawada Center. (iv) Where should the router be placed to provide internet to all the computers in the Vijayawada Center? (v) (a) The Manager at Nagpur wants to remotely access the computer in Admin block in Vijayawada. Which protocol will be used for this ? **OR** (b) Which type of Network (PAN, LAN, MAN or WAN) will be set up among the computers connected with Vijayawada Center ?	
Ans	(i) **PSYCHIATRY** Block as it has the maximum number of Computers. **OR** **ADMIN** Block as is generally the most secure. **OR** **ADMIN** Block as is closest to all the blocks. **OR** Any other location with valid justification.		
	(1 Mark for suggesting a block with valid justification)		
	(ii) Switch/Hub/Router (Any one)		
	(1 Mark for writing correct answer)		
	(iii)  OR  OR		

	 OR Any other valid efficient cable layout	
	(1 Mark for drawing the correct cable layout)	
	(iv) Router should be placed where the server is placed. ***Note:*** As per the recent network technologies, Router can be connected in any of the blocks as all the blocks are networked. So, the marks should be awarded accordingly.	
	(1 Mark for writing the correct answer)	
	(v) **(a)** TELNET **OR** **(b)** LAN or MAN or WAN (Not PAN)	
	(a) ***(1 Mark for writing the correct answer)*** ***OR*** **(b)** ***(1 Mark for writing the correct answer)***	

Set-4

Series &RQPS

प्रश्न–पत्र कोड
Q.P. Code **91**

रोल नं.
Roll No.

Candidates must write the Q.P. Code on the title page of the answer-book.

COMPUTER SCIENCE

*Time allowed : **3** hours* *Maximum Marks : **70***

NOTE

(I) Please check that this question paper contains **15** printed pages.

(II) Please check that this question paper contains **35** questions.

(III) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.

(IV) **Please write down the serial number of the question in the answer-book before attempting it.**

(V) 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the candidates will read the question paper only and will not write any answer on the answer-book during this period.

General Instructions :

(i) *Please check this question paper contains **35** questions.*

(ii) *The paper is divided into 5 Sections – A, B, C, D and E.*

(iii) ***Section A,** consists of **18** questions **(1** to **18)**. Each question carries **1** mark.*

(iv) ***Section B,** consists of **7** questions **(19** to **25)**. Each question carries **2** marks.*

(v) ***Section C,** consists of **5** questions **(26** to **30)**. Each question carries **3** marks.*

(vi) ***Section D,** consists of **2** questions **(31** to **32)**. Each question carries **4** marks.*

(vii) ***Section E,** consists of **3** questions **(33** to **35)**. Each question carries **5** marks.*

(viii) *All programming questions are to be answered using Python Language only.*

SECTION – A

1. State True or False : **1**

While defining a function in Python, the positional parameters in the function header must always be written after the default parameters.

2. The **SELECT** statement when combined with _____ clause, returns records without repetition. **1**

(a) **DISTINCT** (b) **DESCRIBE**

(c) **UNIQUE** (d) **NULL**

3. What will be the output of the following statement : **1**

```
print (16*5/4*2/5-8)
```

(a) `-3.33` (b) `6.0`

(c) `0.0` (d) `-13.33`

4. What possible output from the given options is expected to be displayed when the following Python code is executed ? **1**

```
import random
Signal = ['RED', 'YELLOW', 'GREEN']
for K in range(2, 0, -1) :
    R = random.randrange(K)
    print (Signal[R], end = '#')
```

(a) **YELLOW # RED #** (b) **RED # GREEN #**

(c) **GREEN # RED #** (d) **YELLOW # GREEN #**

5. In SQL, the aggregate function which will display the cardinality of the table is _____. 1

(a) `sum()` (b) `count(*)`

(c) `avg()` (d) `sum(*)`

6. Which protocol out of the following is used to send and receive emails over a computer network ? 1

(a) `PPP` (b) `HTTP`

(c) `FTP` (d) `SMTP`

7. Identify the invalid Python statement from the following : 1

(a) `d = dict()` (b) `e = {}`

(c) `f = []` (d) `g = dict{}`

8. Consider the statements given below and then choose the correct output from the given options : 1

```
myStr="MISSISSIPPI"
print(myStr[:4]+"#"+myStr[-5:])
```

(a) `MISSI#SIPPI` (b) `MISS#SIPPI`

(c) `MISS#IPPIS` (d) `MISSI#IPPIS`

9. Identify the statement from the following which will raise an error : 1

(a) `print("A"*3)` (b) `print(5*3)`

(c) `print("15" + 3)` (d) `print("15" + "13")`

10. Select the correct output of the following code : 1

```
event="G20 Presidency@2023"
L=event.split(' ')
print(L[::-2])
```

(a) `'G20'` (b) `['Presidency@2023']`

(c) `['G20']` (d) `'Presidency@2023'`

11. Which of the following options is the correct unit of measurement for network bandwidth ? **1**

(a) **KB** (b) **Bit**

(c) **Hz** (d) **Km**

12. Observe the given Python code carefully : **1**

```
a=20
def convert(a):
    b=20
    a=a+b

convert(10)
print(a)
```

Select the correct output from the given options :

(a) 10 (b) 20

(c) 30 (d) Error

13. State whether the following statement is True or False : **1**

While handling exceptions in Python, name of the exception has to be compulsorily added with **except** clause.

14. Which of the following is not a DDL command in SQL ? **1**

(a) **DROP** (b) **CREATE**

(c) **UPDATE** (d) **ALTER**

15. Fill in the blank : **1**

_____ is a set of rules that needs to be followed by the communicating parties in order to have a successful and reliable data communication over a network.

16. Consider the following Python statement : 1

```
F=open('CONTENT.TXT')
```

Which of the following is an invalid statement in Python ?

(a) `F.seek(1,0)` (b) `F.seek(0,1)`

(c) `F.seek(0,-1)` (d) `F.seek(0,2)`

Q. **17** and **18** are ASSERTION (A) and REASONING (R) based questions. Mark the correct choice as

(a) Both (A) and (R) are true and (R) is the correct explanation for (A).

(b) Both (A) and (R) are true and (R) is not the correct explanation for (A).

(c) (A) is true but (R) is false.

(d) (A) is false but (R) is true.

17. **Assertion (A) :** CSV file is a human readable text file where each line has a number of fields, separated by comma or some other delimiter. 1

Reason (R) : `writerow()` method is used to write a single row in a CSV file.

18. **Assertion (A) :** The expression `"HELLO".sort()` in Python will give an error. 1

Reason (R) : `sort()` does not exist as a method/function for strings in Python.

SECTION – B

19. (A) (i) Expand the following terms : **1 + 1 = 2**

`XML, PPP`

(ii) Give one difference between circuit switching and packet switching.

OR

(B) (i) Define the term web hosting.

(ii) Name any two web browsers.

20. The code given below accepts five numbers and displays whether they are even or odd : **2**

Observe the following code carefully and rewrite it after removing all syntax and logical errors :

Underline all the corrections made.

```
def EvenOdd()
    for i in range(5):
        num=int(input("Enter a number")
        if num/2==0:
            print("Even")
        else:
        print("Odd")
EvenOdd()
```

21. (A) Write a user defined function in Python named **showGrades(S)** which takes the dictionary S as an argument. The dictionary, S contains **Name:[Eng,Math,Science]** as **key:value** pairs. The function displays the corresponding grade obtained by the students according to the following grading rules : **2**

Average of Eng,Math,Science	Grade
>=90	A
<90 but >=60	B
<60	C

For example : Consider the following dictionary

```
S={"AMIT":[92,86,64],"NAGMA":[65,42,43],"DAVID":[92,90,88]}
```

The output should be :

```
AMIT - B
NAGMA - C
DAVID - A
```

OR

(B) Write a user defined function in Python named **Puzzle(W,N)** which takes the argument **W** as an English word and **N** as an integer and returns the string where every N^{th} alphabet of the word **W** is replaced with an underscore ("_").

For example : if **W** contains the word **"TELEVISION"** and **N** is 3, then the function should return the string **"TE_EV_SI_N".** Likewise for the word **"TELEVISION"** if **N** is 4, then the function should return **"TEL_VIS_ON".**

22. Write the output displayed on execution of the following Python code : **2**

```
LS=["HIMALAYA", "NILGIRI", "ALASKA", "ALPS"]
D={}
for S in LS :
    if len(S)%4 == 0:
        D[S] = len(S)
for K in D :
    print(K,D[K], sep = "#")
```

23. (A) Write the Python statement for each of the following tasks using built-in functions/methods only : **1 + 1 = 2**

(i) To remove the item whose key is **"NISHA"** from a dictionary named **Students.**

For example, if the dictionary **Students** contains **{"ANITA":90, "NISHA":76, "ASHA":92},** then after removal the dictionary should contain **{"ANITA":90, "ASHA":92}**

(ii) To display the number of occurrences of the substring **"is"** in a string named **message.**

For example if the string **message** contains **"This is his book",** then the output will be 3.

OR

(B) A tuple named **subject** stores the names of different subjects. Write the Python commands to convert the given tuple to a list and thereafter delete the last element of the list.

24. (A) Ms. Veda created a table named **Sports** in a MySQL database, containing columns **Game_id, P_Age and G_name.** **2**

After creating the table, she realized that the attribute, **Category** has to be added. Help her to write a command to add the **Category** column. Thereafter, write the command to insert the following record in the table :

Game_id : G42

P_Age : Above 18

G_name : Chess

Category : Senior

OR

(B) Write the SQL commands to perform the following tasks :

(i) View the list of tables in the database, **Exam.**

(ii) View the structure of the table, **Term1.**

25. Predict the output of the following code : **2**

```
def callon(b=20,a=10):
    b=b+a
    a=b-a
    print(b,"#",a)
    return b
x=100
y=200
x=callon(x,y)
print(x,"@",y)
y=callon(y)
print(x,"@",y)
```

SECTION – C

26. Write the output on execution of the following Python code : **3**

```
S="Racecar Car Radar"
L=S.split()
for W in L :
    x=W.upper()
    if x==x[::-1]:
        for I in x:
            print(I,end="*")
    else:
        for I in W:
            print(I,end="#")
    print()
```

27. Consider the table ORDERS given below and write the output of the SQL queries that follow : **1 × 3 = 3**

ORDNO	ITEM	QTY	RATE	ORDATE
1001	RICE	23	120	2023-09-10
1002	PULSES	13	120	2023-10-18
1003	RICE	25	110	2023-11-17
1004	WHEAT	28	65	2023-12-25
1005	PULSES	16	110	2024-01-15
1006	WHEAT	27	55	2024-04-15
1007	WHEAT	25	60	2024-04-30

(i) `SELECT ITEM, SUM(QTY) FROM ORDERS GROUP BY ITEM;`

(ii) `SELECT ITEM, QTY FROM ORDERS WHERE ORDATE BETWEEN '2023-11-01' AND '2023-12-31';`

(iii) `SELECT ORDNO, ORDATE FROM ORDERS WHERE ITEM = 'WHEAT' AND RATE>=60;.`

28. (A) Write a user defined function in Python named **showInLines()** which reads contents of a text file named **STORY.TXT** and displays every sentence in a separate line. **3**

Assume that a sentence ends with a full stop (.), a question mark (?), or an exclamation mark (!).

For example, if the content of file **STORY.TXT** is as follows :

```
Our parents told us that we must eat vegetables to be
healthy. And it turns out, our parents were right! So,
what else did our parents tell?
```

Then the function should display the file's content as follows :

```
Our parents told us that we must eat vegetables to be
healthy.
And it turns out, our parents were right!
So, what else did our parents tell?
```

OR

(B) Write a function, **c_words()** in Python that separately counts and displays the number of uppercase and lowercase alphabets in a text file, **Words.txt**.

29. Consider the table **Projects** given below : **1 × 3 = 3**

Table : Projects

P_id	Pname	Language	Startdate	Enddate
P001	School Management System	Python	2023-01-12	2023-04-03
P002	Hotel Management System	C++	2022-12-01	2023-02-02
P003	Blood Bank	Python	2023-02-11	2023-03-02
P004	Payroll Management System	Python	2023-03-12	2023-06-02

Based on the given table, write SQL queries for the following :

(i) Add the constraint, **primary key** to column **P_id** in the existing table **Projects**.

(ii) To change the language to **Python** of the project whose id is **P002**.

(iii) To delete the table **Projects** from MySQL database along with its data.

30. Consider a list named **Nums** which contains random integers.

Write the following user defined functions in Python and perform the specified operations on a stack named **BigNums.** **3**

(i) **PushBig() :** It checks every number from the list **Nums** and pushes all such numbers which have **5 or more digits** into the stack, **BigNums.**

(ii) **PopBig() :** It pops the numbers from the stack, **BigNums** and displays them. The function should also display **"Stack Empty"** when there are no more numbers left in the stack.

For example: If the list **Nums** contains the following data :

```
Nums = [213,10025,167,254923,14,1297653,31498,386,92765]
```

Then on execution of **PushBig()**, the stack **BigNums** should store :

```
[10025, 254923, 1297653, 31498, 92765]
```

And on execution of **PopBig()** , the following output should be displayed :

```
92765
31498
1297653
254923
10025
Stack Empty
```

SECTION – D

31. Consider the tables **Admin** and **Transport** given below : **1 × 4 = 4**

Table : Admin

S_id	S_name	Address	S_type
S001	Sandhya	Rohini	Day Boarder
S002	Vedanshi	Rohtak	Day Scholar
S003	Vibhu	Raj Nagar	NULL
S004	Atharva	Rampur	Day Boarder

Table : Transport

S_id	Bus_no	Stop_name
S002	TSS10	Sarai Kale Khan
S004	TSS12	Sainik Vihar
S005	TSS10	Kamla Nagar

Write SQL queries for the following :

(i) Display the student name and their stop name from the tables **Admin** and **Transport.**

(ii) Display the number of students whose **S_type** is not known.

(iii) Display all details of the students whose name starts with **'V'.**

(iv) Display student id and address in alphabetical order of student name, from the table **Admin**.

32. Sangeeta is a Python programmer working in a computer hardware company. She has to maintain the records of the peripheral devices. She created a csv file named **Peripheral.csv,** to store the details. The structure of **Peripheral.csv** is : 4

[P_id,P_name,Price]

where

P_id is Peripheral device ID (integer)

P_name is Peripheral device name (String)

Price is Peripheral device price (integer)

Sangeeta wants to write the following user defined functions :

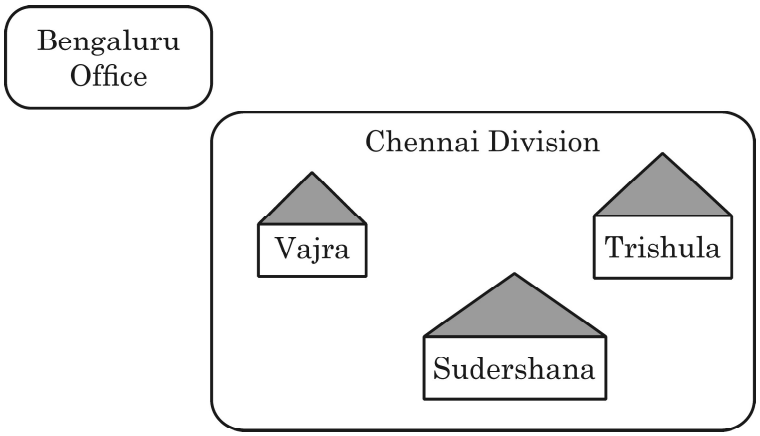
Add_Device() : to accept a record from the user and add it to a csv file, **Peripheral.csv.**

Count_Device() : To count and display number of peripheral devices whose price is less than 1000.

SECTION – E

33. Infotainment Ltd. is an event management company with its prime office located in Bengaluru. The company is planning to open its new division at three different locations in Chennai named as - Vajra, Trishula and Sudershana. **1 × 5 = 5**

You, as a networking expert need to suggest solutions to the questions in part (i) to (v), keeping in mind the distances and other given parameters.



Distances between various locations :

Vajra to Trishula	350 m
Trishula to Sudershana	415 m
Sudershana to Vajra	300m
Bengaluru Office to Chennai	2000 km

Number of computers installed at various locations :

Vajra	120
Sudershana	75
Trishula	65
Bengaluru Office	250

(i) Suggest and draw the cable layout to efficiently connect various locations in Chennai division for connecting the digital devices.

(ii) Which block in Chennai division should host the server ? Justify your answer.

(iii) Which fast and effective wired transmission medium should be used to connect the prime office at Bengaluru with the Chennai division ?

(iv) Which network device will be used to connect the digital devices within each location of Chennai division so that they may communicate with each other ?

(v) A considerable amount of data loss is noticed between different locations of the Chennai division, which are connected in the network. Suggest a networking device that should be installed to refresh the data and reduce the data loss during transmission to and from different locations of Chennai division.

34. (A) (i) Differentiate between `'w'` and `'a'` file modes in Python. **2 + 3 = 5**

(ii) Consider a binary file, **`items.dat`,** containing records stored in the given format :

```
{item_id: [item_name,amount]}
```

Write a function, **`Copy_new()`,** that copies all records whose amount is greater than 1000 from **`items.dat` to `new_items.dat`.**

OR

(B) (i) What is the advantage of using **`with`** clause while opening a data file in Python ? Also give syntax of **`with`** clause.

(ii) A binary file, **`EMP.DAT`** has the following structure :

```
[Emp_Id, Name, Salary]
```

where

`Emp_Id` : Employee id

`Name` : Employee Name

`Salary` : Employee Salary

Write a user defined function, **`disp_Detail()`**, that would read the contents of the file **`EMP.DAT`** and display the details of those employees whose salary is below **`25000`.**

35. (A) (i) Define cartesian product with respect to RDBMS. **1 + 4 = 5**

(ii) Sunil wants to write a program in Python to update the quantity to **20** of the records whose item code is **111** in the table named `shop` in MySQL database named `Keeper`.

The table `shop` in MySQL contains the following attributes :

- `Item_code`: Item code (Integer)
- `Item_name`: Name of item (String)
- `Qty`: Quantity of item (Integer)
- `Price`: Price of item (Integer)

Consider the following to establish connectivity between Python and MySQL :

- Username : `admin`
- Password : `Shopping`
- Host : `localhost`

OR

(B) (i) Give any two features of SQL.

(ii) Sumit wants to write a code in Python to display all the details of the passengers from the table `flight` in MySQL database, `Travel`. The table contains the following attributes :

`F_code`: Flight code (String)

`F_name`: Name of flight (String)

`Source`: Departure city of flight (String)

`Destination`: Destination city of flight (String)

Consider the following to establish connectivity between Python and MySQL :

- Username : `root`
- Password : `airplane`
- Host : `localhost`

CBSE AISSCE 2024 Marking Scheme for Computer Science

(Series &RQPS Sub Code: 083 Q.P. Code 91) SET-4

Marking Scheme

Strictly Confidential

(For Internal and Restricted use only)

Senior Secondary School Certificate Examination, 2024

Subject Name: Computer Science (Q.P. CODE 91)

1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
2	"Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its' leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc. may invite action under various rules of the Board and IPC."
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-XII, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4	The Marking scheme carries only suggested value points for the answers These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6	Evaluators will mark(√) wherever answer is correct. For wrong answer CROSS 'X' be marked. Evaluators will not put right (✓)while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
9	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note "Extra Question".
10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11	A full scale of marks **70 marks** as given in Question Paper has to be used. Please do not hesitate to award full marks if the answer deserves it.

12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- ● Leaving answer or part thereof unassessed in an answer book. ● Giving more marks for an answer than assigned to it. ● Wrong totaling of marks awarded on an answer. ● Wrong transfer of marks from the inside pages of the answer book to the title page. ● Wrong question wise totaling on the title page. ● Wrong totaling of marks of the two columns on the title page. ● Wrong grand total. ● Marks in words and figures not tallying/not same. ● Wrong transfer of marks from the answer book to online award list. ● Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) ● Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16	The Examiners should acquaint themselves with the guidelines given in the “Guidelines for Spot Evaluation” before starting the actual evaluation.
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
18	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

SPECIFIC INSTRUCTIONS FOR COMPUTER SCIENCE ONLY

1	**In Python, string content is accepted within a pair of single quotes ' ' or within a pair of double quotes " ".**
2	**In MySQL, CHAR/VARCHAR/DATE type content is accepted within a pair of single quotes ' ' or within a pair of double quotes " ".**
3	**In MySQL commands, lowercase/UPPERCASE both are correct.**
4	**In MySQL output questions, column headings to be ignored.**
5	**In MySQL output questions, alignment (left/right) of content to be ignored.**
6	**All answers/codes are suggestive, any other alternative correct answers to be accepted.**

CBSE AISSCE 2024 Marking Scheme for Computer Science

(Series &RQPS Sub Code: 083 Q.P. Code 91) SET-4

General Instructions:

- ***(i) Please check this question paper which contains 35 questions.***
- ***(ii) The paper is divided into 5 Sections - A, B, C, D and E.***
- ***(iii) Section A, consists of 18 questions (1 to 18). Each question carries 1 Mark.***
- ***(iv) Section B, consists of 7 questions (19 to 25). Each question carries 2 Marks.***
- ***(v) Section C, consists of 5 questions (26 to 30). Each question carries 3 Marks.***
- ***(vi) Section D, consists of 2 questions (31 to 32). Each question carries 4 Marks.***
- ***(vii) Section E, consists of 3 questions (33 to 35). Each question carries 5 Marks.***
- ***(viii) All programming questions are to be answered using Python Language only.***

SECTION-A

1.	State True or False :				1
	While defining a function in Python, the positional parameters in the function header must always be written after the default parameters.				
Ans	False				
	(1 Mark for the correct answer)				
2.	The **SELECT** statement when combined with ___ clause, returns records without repetition.				1
	(a)	`DISTINCT`	(b)	`DESCRIBE`	
	(c)	`UNIQUE`	(d)	`NULL`	
Ans	(a)	`DISTINCT`			
	(1 Mark for the correct answer)				
3.	What will be the output of the following statement :				1
	`print (16*5/4*2/5-8)`				
	(a)	`- 3.33`	(b)	`6.0`	
	(c)	`0.0`	(d)	`-13.33`	
Ans	(c)	`0.0`			
	(1 Mark for the correct answer)				
4.	What possible output from the given options is expected to be displayed when the following Python code is executed ?				1

```
import random
Signal=['RED','YELLOW','GREEN']
for K in range (2, 0, - 1) :
  R = random.randrange(K)
  print (Signal[R], end = '#')
```

	(a)	`YELLOW # RED #`	(b)	`RED # GREEN #`	
	(c)	`GREEN # RED #`	(d)	`YELLOW # GREEN #`	
Ans	(a)	`YELLOW # RED #`			
	(1 Mark for the correct answer)				
5.	In SQL, the aggregate function which will display the cardinality of the table is _____.				1
	(a)	`sum()`	(b)	`count(*)`	
	(c)	`avg()`	(d)	`sum(*)`	
Ans	(b)	`count(*)`			
	(1 Mark for the correct answer)				
6.	Which protocol out of the following is used to send and receive emails over a computer network ?				1
	(a)	`PPP`	(b)	`HTTP`	
	(c)	`FTP`	(d)	`SMTP`	
Ans	(d)	`SMTP`			
	(1 Mark for the correct answer)				
7.	Identify the invalid Python statement from the following :				1
	(a)	`d = dict()`	(b)	`e = {}`	
	(c)	`f = []`	(d)	`g = dict{}`	
Ans	(d)	`g = dict{}`			
	(1 Mark for the correct answer)				

8.	Consider the statements given below and then choose the correct output from the given options :
	`myStr = "MISSISSIPPI"`
	`print(myStr[:4]+"#"+myStr[-5:])`
					1

	(a)	`MISSI#SIPPI`	(b)	`MISS#SIPPI`	
	(c)	`MISS#IPPIS`	(d)	`MISSI#IPPIS`	
Ans	(b)	`MISS#SIPPI`			
	(1 Mark for the correct answer)				
9.	Identify the statement from the following which will raise an error :				1
	(a)	`print("A"*3)`	(b)	`print(5*3)`	
	(c)	`print("15" + 3)`	(d)	`print("15" + "13")`	

Ans	(c)	`print("15" + 3)`			
	(1 Mark for the correct answer)				

10.	Select the correct output of the following code :
	
	`event="G20 Presidency@2023"`
	`L=event.split(' ')`
	`print(L[::-2])`
					1

	(a)	`'G20'`	(b)	`['Presidency@2023']`	
	(c)	`['G20']`	(d)	`'Presidency@2023'`	
Ans	(b)	`['Presidency@2023']`			
	(1 Mark for the correct answer)				
11.	Which of the following options is the correct unit of measurement for network bandwidth ?				1
	(a)	`KB`	(b)	`Bit`	
	(c)	`Hz`	(d)	`Km`	
Ans	(c)	`Hz`			
	(1 Mark for the correct answer)				

12.	Observe the given Python code carefully :
	
	`a=20`
	`def convert(a):`
	`  b=20`
	`  a=a+b`
	
	`convert(10)`
	`print(a)`
	
	Select the correct output from the given options :
					1

	(a)	`10`	(b)	`20`	
	(c)	`30`	(d)	`Error`	
Ans	(b)	`20`			
	(1 Mark for the correct answer)				
13.	State whether the following statement is True or False: While handling exceptions in Python, name of the exception has to be compulsorily added with **except** clause.				1
Ans	`False`				
	(1 Mark for the correct answer)				

14.	Which of the following is not a DDL command in SQL ?				1
	(a)	**DROP**	(b)	**CREATE**	
	(c)	**UPDATE**	(d)	**ALTER**	
Ans	(c)	**UPDATE**			
	(1 Mark for the correct answer)				
15.	Fill in the blank : _____ is a set of rules that needs to be followed by the communicating parties in order to have a successful and reliable data communication over a network.				1
Ans	Protocol OR Name of any protocol				
	(1 Mark for the correct answer as protocol or name of any protocol)				
16.	Consider the following Python statement : `F=open('CONTENT.TXT')` Which of the following is an invalid statement in Python ?				1
	(a)	`F.seek(1,0)`	(b)	`F.seek(0,1)`	
	(c)	`F.seek(0,-1)`	(d)	`F.seek(0,2)`	
Ans	(c)	`F.seek (0,−1)`			
	(1 Mark for the correct answer)				
Q. **17** and **18** are ASSERTION (A) and REASONING (R) based questions. Mark the correct choice as					
	(a)	Both (A) and (R) are true and (R) is the correct explanation for (A).			
	(b)	Both (A) and (R) are true and (R) is not the correct explanation for (A).			
	(c)	(A) is true but (R) is false.			
	(d)	(A) is false but(R) is true.			
17	**Assertion (A) :** CSV file is a human readable text file where each line has a number of fields, separated by comma or some other delimiter. **Reason (R):** `writerow()` method is used to write a single row in a CSV file.				1
Ans	**(b)**	Both (A) and (R) are true and (R) is not the correct explanation for (A).			
		(1 Mark for the correct answer)			
18	**Assertion (A):** The expression `"Hello".sort()` in Python will give an error. **Reason (R):** `sort()` does not exist as a method/function for strings in Python.				1

Ans	(a)	**Both (A) and (R) are true and (R) is the correct explanation for (A).**	
		(1 Mark for the correct answer)	

SECTION-B

19	(A)	(i) Expand the following terms: **XML ,PPP** (ii) Give one difference between circuit switching and packet switching. **OR**	2
	(B)	(i) Define the term web hosting. (ii) Name any two web browsers.	
Ans	(A)	(i) eXtensible Markup Language Point-to-Point Protocol	
		(½ Mark for writing correct expansion of XML) ***(½ Mark for writing correct expansion of PPP)***	
Ans		(ii)	

Circuit Switching	Packet Switching
A dedicated path is established between the sender and the receiver before starting data transmission. Entire data is transmitted in one go.	Data to be transmitted is divided into small packets which are transmitted via nearest service provider till all packets reach the recipient where the packets are reassembled.

		(½ Mark for writing correct technique for Circuit Switching) ***(½ Mark for writing correct technique for Packet Switching)***	
		OR	
Ans	(B)	(i) Web hosting is a service that allows users to put a website or a webpage onto the internet, and make it a part of the World Wide Web.	
		(1 Mark for writing the correct definition of Web hosting)	
		(ii) Google Chrome,Microsoft Edge, Safari, Mozilla Firefox, Opera etc.	
		(1 mark for writing names of any two web browsers)	
20	The code given below accepts five numbers and displays whether they are even or odd: Observe the following code carefully and rewrite it after removing all syntax and logical errors : Underline all the corrections made.		2

```
def EvenOdd()
  for i in range(5) :
     num=int(input("Enter a number")
     if num/2==0:
        print("Even")
     else:
     print("Odd")
EvenOdd()
```

Ans

```
def EvenOdd():                          # Error 1
  for i in range(5) :
     num=int(input("Enter a number"))   # Error 2
     if num%2==0:                       # Error 3
       print("Even")
     else:
      print("Odd")                      # Error 4
EvenOdd()
```

(½ Mark for each correction made)

21. (A) Write a user defined function in Python named **showGrades(S)** which takes the dictionary S as an argument. The dictionary, S contains **Name:[Eng,Math,Science]** as **key:value** pairs. The function displays the corresponding grade obtained by the students according to the following grading rules : 2

Average of Eng,Math,Science	Grade
>=90	A
<90 but >=60	B
<60	C

For example : Consider the following dictionary

```
S={"AMIT":[92,86,64],"NAGMA":[65,42,43],"DAVID":[92,90,88]}
```

The output should be :

```
AMIT - B
NAGMA - C
DAVID - A
```

Ans

```
def showGrades(S):
  for K, V in S. items():
    if sum(V)/3>=90:
      Grade="A"
    elif sum(V)/3>=60:
      Grade="B"
    else:
      Grade="C"
    print(K,"-",Grade)
S={"AMIT":[92,86,64],"NAGMA":[65,42,43],"DAVID":[92,90,88]}
showGrades(S)
```

OR

```
def showGrades(S):
  for K in S:
    Sum=0
    for i in range(3):
      Sum+=S[K][i]
    if Sum/3>=90:
      Grade="A"
    elif Sum/3>=60:
      Grade="B"
    else:
      Grade="C"
    print(K,"-",Grade)
S={"AMIT":[92,86,64],"NAGMA":[65,42,43],"DAVID":[92,90,88]}
showGrades(S)
```

OR
Any other correct variation of the code

(½ Mark for the loop to process individual students from the dictionary)
(1 Mark for calculating grades)
(½ Mark for displaying grades)

OR

(B) Write a user defined function in Python named **`Puzzle(W,N)`** which takes the argument **`W`** as an English word and **`N`** as an integer and returns the string where every Nth alphabet of the word **`W`** is replaced with an underscore (**`"_"`**).

For example : if **`W`** contains the word **`"TELEVISION"`** and **`N`** is **`3`**, then the function should return the string **`"TE_EV_SI_N"`**. Likewise for the word **`"TELEVISION"`** if **`N`** is **`4`**, then the function should return **`"TEL_VIS_ON"`**.

Ans

```
Word="TELEVISION"
def Puzzle(W, N):
    NW=""
    Count=1
    for Ch in W:
        if Count!=N:
            NW+=Ch
            Count+=1
        else:
            NW+="_"
            Count=1
    return NW
print(Puzzle(Word,3))
```

OR

```
def Puzzle(W,N):
  W1=""
  for i in range(len(W)):
    if (i+1)%N==0:
      W1=W1+"_"
    else:
      W1=W1+W[i]
  return W1
print(Puzzle("TELEVISION",4))
```

OR
Any other correct variation of the code

(½ Mark for the loop to process individual (or Nth) characters)
(1 Mark for changing/replacing the required characters)
(½ Mark for returning the new word)

22. Write the output displayed on execution of the following Python code : 2

```
LS=["HIMALAYA","NILGIRI","ALASKA","ALPS"]
D={}
for S in LS :
    if len(S)%4 == 0:
            D[S] = len(S)
for K in D :
    print(K,D[K], sep = "#")
```

Ans		**HIMALAYA#8** **ALPS#4**	
		(1 Mark for each line of output) ***(Deduct ½ Mark if the entire output is correct but the formatting or line break or separating characters is/are incorrect)***	
23.	(A)	Write the Python statement for each of the following tasks using built-in functions/methods only : (i) To remove the item whose key is **"NISHA"** from a dictionary named **Students**. For example, if the dictionary **Students** contains **{"ANITA":90, "NISHA":76, "ASHA":92}**, then after removal the dictionary should contain **{"ANITA":90,"ASHA":92}** (ii) To display the number of occurrences of the substring **"is"** in a string named **message**. For example if the string **message** contains **"This is his book"**, then the output will be **3**.	1+1=2
Ans	(A)	**(i)** **Students.pop("NISHA")** **OR** **del(Students["NISHA"])** **OR** **del Students["NISHA"]** **OR** Any other correct variation of the code **(ii)** **print(message.count("is"))** **OR** **message.count("is")** **OR** Any other correct variation of the code	
		(1 Mark for each correct command)	
		OR	
	(B)	A tuple named **subject** stores the names of different subjects. Write the Python commands to convert the given tuple to a list and thereafter delete the last element of the list.	
Ans	(B)	**subject=list(subject)** **subject.pop()** **OR** **subject=list(subject)** **subject.pop(-1)** **OR** **subject=list(subject)** **del(subject[-1])** **OR** **subject=list(subject)** **del subject[-1]**	

		OR Any other correct variation of the code	
		(1 Mark for correctly converting to list) ***(1 Mark for correctly popping the last element/name)***	
24.	(A)	Ms. Veda created a table named **`Sports`** in a MySQL database, containing columns **`Game_id, P_Age and G_name.`** After creating the table, she realized that the attribute, **`Category`** has to be added. Help her to write a command to add the **`Category`** column. Thereafter, write the command to insert the following record in the table : **`Game_id : G42`** **`P_Age : Above 18`** **`G_name : Chess`** **`Category : Senior`**	2
Ans	(A)	**`ALTER TABLE SPORTS`** **`ADD CATEGORY VARCHAR(10);`** OR **`ALTER TABLE SPORTS`** **`ADD COLUMN CATEGORY VARCHAR(10);`** OR **`ALTER TABLE SPORTS`** **`ADD CATEGORY CHAR(10);`** OR **`ALTER TABLE SPORTS`** **`ADD COLUMN CATEGORY CHAR(10);`** **`INSERT INTO SPORTS`** **`VALUES("G42","Above 18","Chess","Senior");`** OR **`INSERT INTO SPORTS(Game_id, P_Age, G_name, Category)`** **`VALUES("G42","Above 18","Chess","Senior");`**	
		(½ Mark for **`ALTER TABLE`** ***command)*** ***(½ Mark for*** **`ADD CATEGORY part`***)* ***(½ Mark for*** **`INSERT INTO`** ***command)*** ***(½ Mark for*** **`VALUES part`** ***)***	
		OR	
	(B)	Write the SQL commands to perform the following tasks : (i) View the list of tables in the database, **`Exam`**. (ii) View the structure of the table, **`Term1`**.	
Ans	(B)	**(i)** **`SHOW TABLES;`** **(ii)** **`DESCRIBE Term1`** OR **`DESC Term1`** **Note: Ignore** **`USE Exam;`** **if not written**	
		(1 Mark for each correct command)	

25		Predict the output of the following code :
		`def callon(b=20,a=10) :`
		`  b=b+a`
		`  a=b-a`
		`  print(b, "#" , a )`
		`  return b`
		`x=100`
		`y=200`
		`x=callon(x,y)`
		`print (x,"@", y)`
		`y=callon(y)`
		`print (x,"@",y)`
			2

Ans		`300#100`
		`300@200`
		`210#200`
		`300@210`	

		(½ Mark for each line of correct output) *(Deduct ½ mark only if all the numeric parts of the output are correct but formatting or/and separators are incorrect)*	

SECTION C

26.		Write the output on execution of the following Python code:
		`S="Racecar Car Radar"`
		`L=S.split()`
		`for W in L :`
		`  x=W.upper()`
		`  if x==x[::-1]:`
		`  for I in x:`
		`  print(I,end="*")`
		`  else:`
		`  for I in W:`
		`  print(I,end="#")`
		`  print()`
			3

Ans		`R*A*C*E*C*A*R*`
		`C#a#r#`
		`R*A*D*A*R*`	

		(1 Mark for each line of correct output) *Note:* ● *Deduct ½ mark only if all the alphabets are correct but some cases - lower/upper are incorrectly written* ● *Deduct ½ mark only if all the alphabets are correct but separators - */# are incorrectly written OR new line not considered*	

27 Consider the table ORDERS given below and write the output of the SQL queries that follow: **1x3 =3**

ORDNO	ITEM	QTY	RATE	ORDATE
1001	RICE	23	120	2023-09-10
1002	PULSES	13	120	2023-10-18
1003	RICE	25	110	2023-11-17
1004	WHEAT	28	65	2023-12-25
1005	PULSES	16	110	2024-01-15
1006	WHEAT	27	55	2024-04-15
1007	WHEAT	25	60	2024-04-30

```
(i)  SELECT ITEM, SUM(QTY) FROM ORDERS GROUP BY ITEM;
(ii) SELECT ITEM, QTY FROM ORDERS WHERE  ORDATE BETWEEN
     '2023-11-01' AND '2023-12-31';
(iii) SELECT ORDNO, ORDATE FROM ORDERS WHERE ITEM = 'WHEAT'
     AND RATE>=60 ;
```

Ans

(i)

ITEM	SUM(QTY)
RICE	48
PULSES	29
WHEAT	80

(ii)

ITEM	QTY
RICE	25
WHEAT	28

(iii)

ORDNO	ORDATE
1004	2023-12-25
1007	2024-04-30

(1 Mark for writing each correct output)

Note:

- ***Ignore output heading***
- ***Ignore order of rows***

28 (A) Write a user defined function in Python named **showInLines()** which reads contents of a text file named **STORY.TXT** and displays every sentence in a separate line. **3**

Assume that a sentence ends with a full stop (.), a question mark (?), or an exclamation mark (!).

		For example, if the content of file **STORY.TXT** is as follows : **Our parents told us that we must eat vegetables to be healthy.And it turns out, our parents were right! So, what else did our parents tell?** Then the function should display the file's content as follows : **Our parents told us that we must eat vegetables to be healthy. And it turns out, our parents were right! So, what else did our parents tell?**	

Ans		**def showInLines():
		  with open("STORY.TXT",'r') as F:
		  S=F.read()
		  for W in S:
		  if W=="." or W=="?" or W=="!":
		  print(W)
		  elif W=="\n":
		  print(end="")
		  else:
		  print(W,end="")
		  F.close()**
		
		OR
		
		**def showInLines():
		  F = open("STORY.TXT",'r')
		  S=F.read()
		  for W in S:
		  if W.endswith(".") or W.endswith("?") or W.endswith("!"):
		  print(W)
		  elif W=="\n":
		  print(end="")
		  else:
		  print(W,end="")
		  F.close()**
		
		OR
		Any other correct variation of the code	

		(½ Mark for correctly opening the file) ***(½ Mark for reading the content of file using any correct method/mode)*** ***(½ Mark for the correct loop)*** ***(½ Mark for correctly checking end of sentence terminating characters)*** ***(½ Mark for correctly printing normal text without sentence terminator)*** ***(½ Mark for correctly printing text with sentence terminator)***	
		OR	
	(B)	Write a function, **c_words()** in Python that separately counts and displays the number of uppercase and lowercase alphabets in a text file, **Words.txt**.	

Ans

```
def c_words():
  f=open("Words.txt","r")
  Txt=f.read()
  CLower=CUpper=0
  for i in Txt:
    if i.islower():
      CLower+=1
    elif i.isupper():
      CUpper+=1
  print(CLower, CUpper)
  f.close()
OR
def c_words():
  with open("Words.txt","r") as F:
    Txt=f.read()
    CL=CU=0
    for i in Txt:
      if i.islower():  # if i>="a" and i<="z":
        CL+=1
      elif i.isupper():# if i>="A" and i<="Z":
        CU+=1
    print(CL, CU)
```

(½ Mark for correctly opening the file)
(½ Mark for reading the content of file using any correct method/mode)
(½ Mark for the correct loop)
(½ Mark for correctly checking and incrementing for uppercase alphabets)
(½ Mark for correctly checking and incrementing for lowercase alphabets)
(½ Mark for printing/returning required output)

29 — 1x3 =3

Consider the table **Projects** given below:

Table: Projects

P_id	Pname	Language	Startdate	Enddate
P001	School Management System	Python	2023-01-12	2023-04-03
P002	Hotel Management System	C++	2022-12-01	2023-02-02
P003	Blood Bank	Python	2023-02-11	2023-03-02
P004	Payroll Management System	Python	2023-03-12	2023-06-02

Based on the given table, write **SQL** queries for the following:

(i) Add the constraint, **primary key** to column **P_id** in the existing table **Projects**.

(ii) To change the language to **Python** of the project whose id is **P002**.

(iii) To delete the table **Projects** from MySQL database along with its data.

Ans

(i)
```
ALTER TABLE Projects
ADD PRIMARY KEY (P_id);
```

(½ Mark for **ALTER TABLE** *part)*
(½ Mark for **ADD PRIMARY KEY** *part)*

		(ii) `UPDATE Projects`
		`SET LANGUAGE= "Python"`
		`WHERE P_id = "P002";`	

		(½ Mark for **`UPDATE - SET`** *part)* *(½ Mark for* **`WHERE`** *part)*	
		(iii) `DROP TABLE Projects;`	
		(1 Mark for **`correct command`***)* ***OR*** *(½ Mark for partial answer such as* **`DROP Projects`** *or* **`DROP TABLE`***)*	
30		Consider a list named **`Nums`** which contains random integers. Write the following user defined functions in Python and perform the specified operations on a stack named **`BigNums`.** (i) **`PushBig()`:** It checks every number from the list **`Nums`** and pushes all such numbers which have **5 or more digits** into the stack, **`BigNums`.** (ii) **`PopBig()`:** It pops the numbers from the stack, **`BigNums`** and displays them. The function should also display **`"Stack Empty"`** when there are no more numbers left in the stack. For example: If the list **`Nums`** contains the following data: **`Nums = [213, 10025, 167, 254923, 14, 1297653, 31498, 386, 92765]`** Then on execution of **`PushBig()`**, the stack **`BigNums`** should store: **`[10025, 254923, 1297653, 31498, 92765]`** And on execution of **`PopBig()`**, the following output should be displayed: **`92765`** **`31498`** **`1297653`** **`254923`** **`10025`** **`Stack Empty`**	3

Ans		`def PushBig(Nums,BigNums):`
		`  for N in Nums:`
		`  if len(str(N)) >= 5:`
		`  BigNums.append(N)`
		`def PopBig(BigNums):`
		`  while BigNums:`
		`  print(BigNums.pop())`
		`  else:`
		`  print("Stack Empty")`
		OR	

```
def PushBig():
  for N in Nums:
      if N >= 10000:
        BigNums.append(N)

def PopBig():
  while BigNums:
    print(BigNums.pop())
  print("Stack Empty")
```

OR
Any other correct variation of the code

(½ Mark for the correct loop in the function PushBig)
(½ Mark for correctly checking the number of digits in the function PushBig)
(½ Mark for pushing the correct number into BigNums in the function PushBig)

(½ Mark for the correct loop in the function PopBig)
(½ Mark for correctly checking the underflow condition and printing `"Stack Empty"` *in the function PopBig)*
(½ Mark for popping and printing the correct number in the function PopBig)

Note:
Ignore the declarations of ***Nums*** *and/or* ***BigNums***

SECTION D

31 — Consider the tables **Admin** and **Transport** given below: — 1x4 =4

Table: Admin

S_id	S_name	Address	S_type
S001	Sandhya	Rohini	Day Boarder
S002	Vedanshi	Rohtak	Day Scholar
S003	Vibhu	Raj Nagar	NULL
S004	Atharva	Rampur	Day Boarder

Table: Transport

S_id	Bus_no	Stop_name
S002	TSS10	Sarai Kale Khan
S004	TSS12	Sainik Vihar
S005	TSS10	Kamla Nagar

Write SQL queries for the following:

(i) Display the student name and their stop name from the tables **Admin** and **Transport**.

Ans

```
SELECT S_name, Stop_name FROM Admin, Transport
WHERE Admin.S_id = Transport.S_id;
```

(½ Mark for **SELECT – FROM** *part)*
(½ Mark for **WHERE** *part)*

	(ii)	Display the number of students whose **S_type** is not known.	
Ans		**SELECT COUNT(*) FROM Admin** **WHERE S_type IS NULL;**	
		(½ Mark for **SELECT – FROM** *part)* *(½ Mark for* **WHERE** *part)*	
	(iii)	Display all details of the students whose name starts with **'V'** .	
Ans		**SELECT * FROM Admin** **WHERE S_name LIKE 'V%';** OR Any other correct query using/without using join	
		(½ Mark for **SELECT – FROM** *part)* *(½ Mark for* **WHERE** *part)*	
	(iv)	Display student id and address in alphabetical order of student name, from the table **Admin**.	
Ans		**SELECT S_id, Address FROM Admin** **ORDER BY S_name;**	
		(½ Mark for **SELECT – FROM** *part)* *(½ Mark for* **ORDER BY** *part)*	
32		Sangeeta is a Python programmer working in a computer hardware company. She has to maintain the records of the peripheral devices. She created a csv file named **Peripheral.csv**, to store the details. The structure of **Peripheral.csv** is: **[P_id,P_name,Price]** where **P_id** is Peripheral device ID (integer) **P_name** is Peripheral device name (String) **Price** is Peripheral device price (integer) Sangeeta wants to write the following user defined functions : **Add_Device()** : to accept a record from the user and add it to a csv file, **Peripheral.csv** **Count_Device()** : To count and display number of peripheral devices whose price is less than 1000.	4

Ans

```
import csv
def Add_Device():
    F=open("Peripheral.csv","a",newline='')
    W=csv.writer(F)
    P_id=int(input("Enter the Peripheral ID"))
    P_name=input("Enter Peripheral Name")
    Price=int(input("Enter Price"))
    L=[P_id,P_name,Price]
    W.writerow(L)
    F.close()
def Count_Device():
    F=open("Peripheral.csv","r")
    L=list(csv.reader(F))
    Count=0
    for D in L:
        if int(D[2])<1000:
            Count+=1
    print(Count)
    F.close()
```

OR
Any other correct variation of the code

(½ Mark for opening the csv file correctly in the function `Add_Device()`)
(½ Mark for reading the data from the user in the function `Add_Device()`)
(½ Mark for writing the data correctly into the csv file in the function `Add_Device()`)
(½ Mark for opening the csv file correctly in the function `Count_Device()`)
(½ Mark for reading the data from the file in the function `Count_Device()`)
(½ Mark for loop in the function `Count_Device()`)
(½ Mark for checking the condition and counting correctly in the function `Count_Device()`)
(½ Mark for printing the output correctly in the function `Count_Device()`)

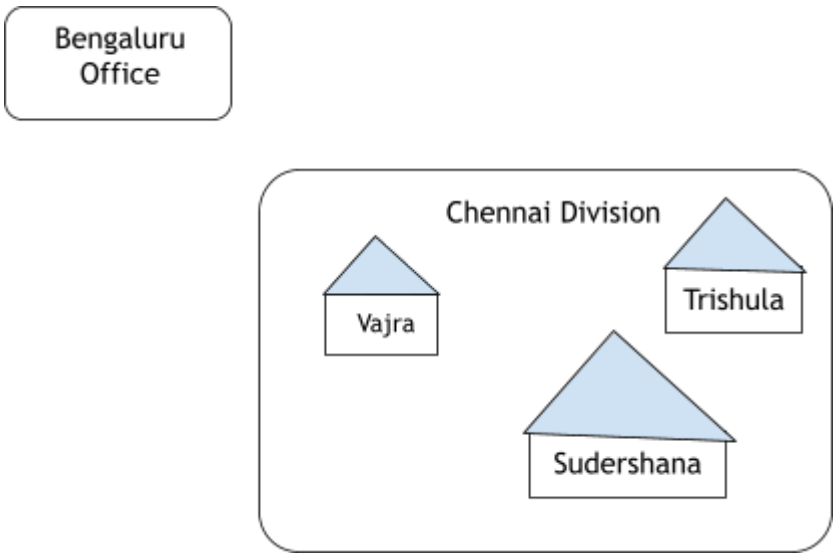
Note:
Full 4 mark should be awarded if the examinee has mentioned that there is no mention of the task in the question

SECTION-E

33

Infotainment Ltd. is an event management company with its prime office located in Bengaluru. The company is planning to open its new division at three different locations in Chennai named as - **Vajra, Trishula and Sudershana.**
You, as a networking expert need to suggest solutions to the questions in part (i) to (v), keeping in mind the distances and other given parameters.

1x5 =5



Distances between various locations:

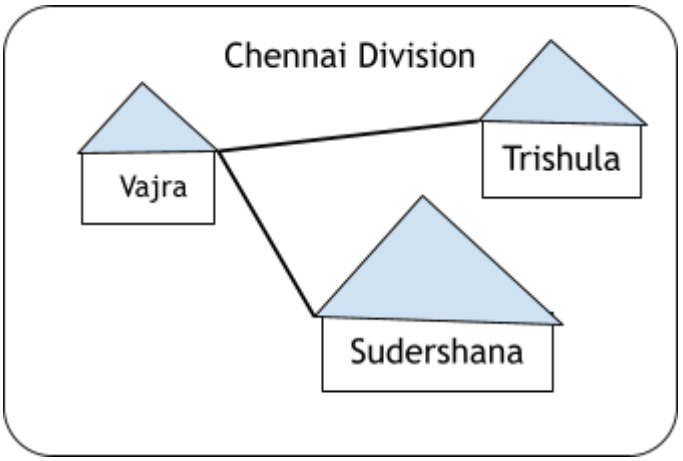
Vajra to Trishula	350 m
Trishula to Sudershana	415 m
Sudershana to Vajra	300 m
Bengaluru Office to Chennai	2000 km

Number of Computers installed at various locations :

Vajra	120
Sudershana	75
Trishula	65
Bengaluru Office	250

(i) Suggest and draw the cable layout to efficiently connect various locations in Chennai division for connecting the digital devices.

Ans



(Full 1 Mark for drawing any valid layout with OR without mentioning topology)
OR
(Only ½ mark for mentioning only topology without cable layout)

	(ii)	Which block in Chennai division should host the server? Justify your answer.	
Ans		**Vajra** can host the server as it has a maximum number of computers. OR Any other answer with valid justification	
		(½ Mark for the correct answer) ***(½ Mark for the correct justification)***	
	(iii)	Which fast and effective wired transmission medium should be used to connect the prime office at Bengaluru with the Chennai division?	
Ans		Optical Fiber	
		(1 Mark for the correct answer)	
	(iv)	Which network device will be used to connect the digital devices within each location of Chennai division so that they may communicate with each other ?	
Ans		Switch/Hub/Router	
		(1 Mark for the correct answer)	
	(v)	A considerable amount of data loss is noticed between the different locations of the Chennai division, which are connected in the network. Suggest a networking device that should be installed to refresh the data and reduce the data loss during transmission to and from different locations of Chennai division.	
Ans		Repeater **OR** **Mentioning any other valid reason or solution for data loss**	
		(1 Mark for the correct answer)	
34	(A)	(i) Differentiate between '**w**' and '**a**' file modes in Python.	2+3 =5
Ans		'**w**': Open the file in write mode. If the file doesn't exist, then a new file will be created. The file pointer is in the beginning of the file. If the file exists, the contents of the file, if any, are lost/truncated and the new data is added as fresh data into the file. '**a**': Open the file in append mode. If the file doesn't exist, then a new file will be created. The file pointer is at the end of the file. If the file exists, the new data is added at the end of the file without deleting the previous contents of the file.	
		(1 Mark each for any one correct characteristics of 'w' mode)	

(1 Mark each for any one correct characteristics of 'a' mode)

(ii)
Consider a binary file, **items.dat,** containing records stored in the given format :
{item_id: [item_name,amount]}

Write a function, **Copy_new()**, that copies all records whose amount is greater than 1000 from **items.dat** to **new_items.dat**.

Ans

```
import pickle
def Copy_new():
  F2=open("new_items.dat","wb")
  try:
    F1=open("items.dat","rb")
    Data1=pickle.load(F1)
    Data2={}
    for K,V in Data1.items():
      if V[1]>1000:
        Data2[K]=V
    pickle.dump(Data2,F2)
    F2.close()
  except:
    print("File not found!")
  F1.close()
```

OR

```
def Copy_new():
  try:
    F1=open("items.dat","rb")
    F2=open("new_items.dat","wb")
    D2={}
    try:
      while True:
        D1=pickle.load(F1)
        for k,v in D1.items():
          if v[1]>1000:
            D2[k]=v
    except:
      pickle.dump(D2,F2)
      F1.close()
      F2.close()
 except:
   print('File Opening Error')
```

OR

```
def Copy_new():
 f=open("items.dat","rb")
 f1=open("new_items.dat","wb")
 while True:
   try:
     r=pickle.load(f)
     for k,v in r.items():
       if v[1]>1000:
         pickle.dump(r, f1)
```

```
   except:
     break
 f.close()
 f1.close()
```

OR
Any other correct variation of the code

(½ Mark for opening the file items.dat in correct mode)
(½ Mark for opening the file new_items.dat in correct mode)
(½ Mark for reading the content of the file items.dat)
(½ Mark for the correct loop)
(½ Mark for checking the condition)
(½ Mark for writing the required contents into the file new_items.dat)

Note: Ignore f.close() and f1.close()

OR

(B) (i) What is the advantage of using **with** clause while opening a data file in Python ? Also give syntax of **with** clause.

The advantage of using **with** clause is that any file that is opened using this clause is closed automatically, once the control comes outside the with clause.
Example:

```
with open("myfile.txt","r+") as file_object:
   content = file_object.read()
```

In Python, we can open a file using **with** clause/statement.

The syntax of **with** clause is:

```
with open (file_name, access_mode) as file_object:
```

(1 Mark for writing any one advantage of with statement)
(1 Mark for writing syntax OR any valid example of with statement)

(ii)
A binary file, **EMP.DAT** has the following structure :
[Emp_Id, Name, Salary]

where
Emp_Id : Employee id
Name : Employee Name
Salary : Employee Salary

Write a user defined function, **disp_Detail()**, that would read the contents of the file **EMP.DAT** and display the details of those employees whose salary is below **25000**.

```
def disp_Detail():
  try:
    with open("EMP.DAT","rb") as F:
```

```
      Data=pickle.load(F)
      for D in Data:
        if D[2]<25000:
           print(D)
  except:
    print("File Not Found!!!")
```

OR

```
def disp_Detail():
  try:
    with open("EMP.DAT","rb") as F:
      try:
        while True:
          Data=pickle.load(F)
          if Data[2]<25000:
             print(Data)
      except:
        print("File ended")
  except:
    print("File Not Found!!!")
```

OR

```
def disp_Detail():
  try:
    with open("EMP.DAT","rb") as F:
      try:
        while True:
          Data=pickle.load(F)
          for D in Data:
            if D[2]<25000:
              print(D)
      except:
        print("File ended")
  except:
    print("File Not Found!!!")
```

OR
Any other correct variation of the code

(½ Mark for opening the file items.dat in correct mode)
(1 Mark for reading the content of the file items.dat)
(½ Mark for the correct loop)
(½ Mark for checking the condition)
(½ Mark for printing the desired output)

35	(A)	(i) Define Cartesian Product with respect to RDBMS.	1+4 =5
	Ans	Cartesian Product operation combines rows/tuples from two tables/relations. It results in all the pairs of rows from both the tables. It is denoted by 'X'.	
		(1 Mark each for the correct definition)	

		(ii) Sunil wants to write a program in Python to update the quantity to **20** of the records whose item code is **111** in the table named **`shop`** in MySQL database named **`Keeper`**. The table **`shop`** in MySQL contains the following attributes : • **`Item_code`**: Item code (Integer) • **`Item_narne`**: Name of item (String) • **`Qty`**: Quantity of item (Integer) • **`Price`**: Price of item (Integer) Consider the following to establish connectivity between Python and MySQL: Username: **`admin`** Password : **`Shopping`** Host: **`localhost`**	
Ans		**`import pymysql as pm`** **`DB=pm.connect(host="localhost",user="admin",\`** **`passwd="Shopping", database="Keeper")`** **`MyCursor=DB.cursor()`** **`SQL=f"UPDATE SHOP SET QTY=%S WHERE ITEM_CODE=%S"%(20,111)`** **# OR** **`SQL="UPDATE SHOP SET QTY=20 WHERE ITEM_CODE=111"`** **`MyCursor.execute(SQL)`** **`DB.commit()`**	
		(½ mark for importing with any correct module/method) ***(1 mark for correct connect())*** ***(½ mark for creating the cursor)*** ***(1 mark for the correct SQL command - ½ Mark for UPDATE SET and ½ Mark for WHERE)*** ***(1 mark for correctly executing SQL)***	
		OR	
	(B)	(i) Give any two features of SQL.	
		Any two of the following • Full form is Structured Query Language. • Is used to retrieve and view specific data from a table in a database. • Is case insensitive • Each query in SQL ends with a semicolon (;) • It contains DDL and DML	
	Ans	***(½ Mark each for the any two correct feature as mentioned above or any other correct feature)***	
		(ii) Sumit wants to write a code in Python to display all the details of the passengers from the table **`flight`** in MySQL database, **`Travel`**. The table contains the following attributes: **`F_ code`** : Flight code (String)	

		F_name: Name of flight (String) **Source:** Departure city of flight (String) **Destination:** Destination city of flight (String) Consider the following to establish connectivity between Python and MySQL: ● Username : **root** ● Password : **airplane** ● Host : **localhost**	
Ans		**import pymysql as pm** **DB=pm.connect(host="localhost",user="root",** **password="airplane",database="Travel")** **MyCursor=DB.cursor()** **MyCursor.execute("SELECT * FROM Flight ")** **Rec=MyCursor.fetchall()** **for R in Rec:** **print (R)** OR Any other correct variation of the code	
		(½ mark for importing any correct module/method pymysql or any other) ***(1 mark for correct connect())*** ***(1 mark for correctly executing the query)*** ***(½ mark for correctly fetching the data)*** ***(1 mark for correctly displaying data)*** ***Note:*** ***Full 4 mark should be awarded if the examinee has mentioned that there is no mention of the task in the question***	