

Series : 4YWZX



SET - 4

रोल नं.
Roll No.

प्रश्न-पत्र कोड
Q.P. Code

91

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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.

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%32*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%32*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 आइडेंटिफाइर (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 प्रतिकरूप 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



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) इम्प्लिसिट 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 ?



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 तत्वों-**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 यूजर-डिफाइंड 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 यूजर डिफाइंड 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 :
- 800 से 1500 के बीच की मजदूरी वाले कर्मचारियों के नाम और मजदूरी (wages) को प्रदर्शित करने के लिये SQL statement लिखिये ।
 - जिन कर्मचारियों की **SITEID** ज्ञात नहीं है, उनका रिकॉर्ड प्रदर्शित करने के लिये SQL statement लिखिए ।
 - उन सभी मजदूरों जिनका **TYPE 'Skilled'** है, उनका **WNAME**, **WAGE** और **HOURS** प्रदर्शित करने के लिए SQL statement लिखिए ।
 - जिन मजदूरों 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 :
- SELECT WNAME, WAGE*HOURS FROM WORKER WHERE SITEID = 103;**
 - SELECT COUNT(DISTINCT TYPE) FROM WORKER;**
 - SELECT MAX(WAGE), MIN(WAGE), TYPE FROM WORKER GROUP BY TYPE;**
 - SELECT WNAME, SITEID FROM WORKER WHERE TYPE="Unskilled" ORDER BY HOURS;**

33. "**P_record.csv**" नामक एक csv फाइल में एक अस्पताल के मरीजों 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 :

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

- मूल्यों (Price) के अवरोही (descending) क्रम में **Articles** table से सभी रिकॉर्ड्स को प्रदर्शित करने के लिए।
- जिन वस्तुओं को वर्ष 2020 में बनाया गया था उनके विवरण प्रदर्शित करने के लिए।
- Artists** table की संरचना (structure) प्रदर्शित करने के लिए।
- (a) इक्वी-जुड़ाव (Equi Join) के द्वारा पेन्टिंग (**Painting**) वाली कलाकृति के सभी कलाकारों के नाम प्रदर्शित करने के लिए।

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- (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 × 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 :

- To display all the records from the **Articles** table in descending order of price.
- To display the details of Articles which were created in the year **2020**.
- To display the structure of **Artists** table.
- (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 - ड

(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 यूजर डिफाइंड 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.

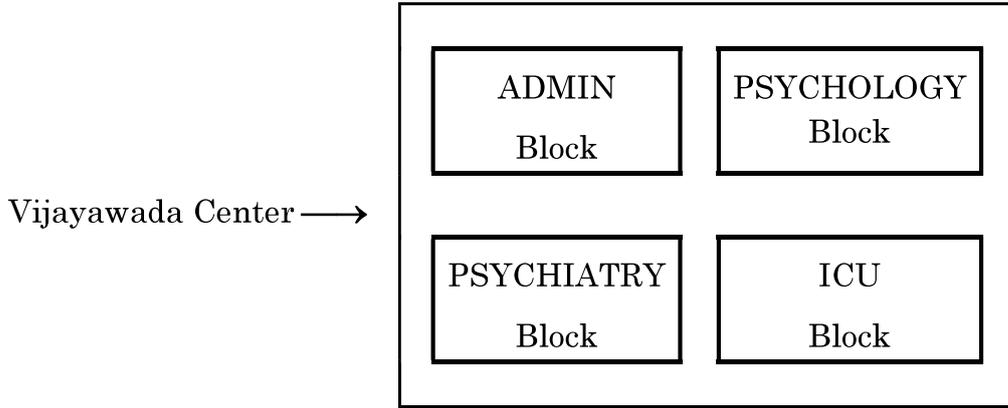
प्रत्येक ब्लॉक में कम्प्यूटर्स की संख्या इस प्रकार है :

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 :

$$5 \times 1 = 5$$



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) 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 प्रोटोकॉल (protocol) प्रयोग किया जाएगा ?

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- (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	<p>Ensure that you do not make the following common types of errors committed by the Examiner in the past:-</p> <ul style="list-style-type: none"> ● 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.	<p>What will be the output of the following statement?</p> <pre>print(14%3**2*4)</pre> <p>(A) 16 (B) 64 (C) 20 (D) 256</p>	1
Ans	(C) 20	
	<i>(1 Mark for writing the correct option)</i>	
3.	<p>Identify the correct output of the following code snippet:</p> <pre>game="Olympic2024" print(game.index("C"))</pre> <p>(A) 0 (B) 6 (C) -1 (D) ValueError</p>	1
Ans	(D) ValueError	
	<i>(1 Mark for writing the correct option)</i>	
4.	<p>Which of the following is the correct identifier?</p> <p>(A) global (B) Break (C) def (D) with</p>	1
Ans	(B) Break	
	<i>(1 Mark for writing the correct option)</i>	
5.	<p>Identify the invalid Python statement out of the following options:</p> <p>(A) <code>print("A",10,end="*")</code> (B) <code>print("A",sep="*",10)</code> (C) <code>print("A",10,sep="*")</code> (D) <code>print("A"*10)</code></p>	1
Ans	(B) <code>print("A",sep="*",10)</code>	
	<i>(1 Mark for writing the correct option)</i>	
6.	<p>Consider the statements given below and then choose the correct output from the given options:</p> <pre>L=['TIC', 'TAC'] print(L[::-1])</pre> <p>(A) ['CIT', 'CAT'] (B) ['TIC', 'TAC'] (C) ['CAT', 'CIT'] (D) ['TAC', 'TIC']</p>	1
Ans	(D) ['TAC', 'TIC']	
	<i>(1 Mark for writing the correct option)</i>	
7.	<p>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?</p> <p>(A) <code>is</code> (B) <code>is not</code> (C) <code>and</code> (D) <code>or</code></p>	1

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	
	<i>(1 Mark for writing the correct answer)</i>	
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	
	<i>(1 Mark for writing the correct option)</i>	
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	
	<i>(1 Mark for writing the correct option)</i>	
19.	Expand ARPANET.	1
Ans	Advanced Research Projects Agency Network	
	<i>(Full 1 Mark for writing the the correct full form)</i> OR <i>(½ Mark for writing any two correct expanded terms)</i>	
	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 <code>pickle.dump()</code> method will display an error. Reason (R): The <code>pickle.dump()</code> method is used to read from a binary file.	1
Ans	(C) Assertion (A) is true, but Reason (R) is false.	
	<i>(1 Mark for writing the correct option)</i>	
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).	
	<i>(1 Mark for writing the correct option)</i>	

SECTION B		(7x2=14)
22.	What does the <code>return</code> statement do in a function ? Explain with the help of an example.	2
Ans	<p>The return statement in Python is used to exit a function and return a value to the caller.</p> <p>Example :</p> <pre>def Add(A, B): return A+B Result=Add(5,3) print(Result)</pre> <p>Output: 8</p>	
	<p><i>(1 Mark for writing the correct explanation)</i> <i>(1 Mark for writing the correct example)</i> OR <i>(Full 2 Marks for correct explanation with the help of a suitable example)</i></p>	
23.	Write one example of each of the following in Python : (i) Syntax Error (ii) Implicit Type conversion	2
Ans	<p>(i) Syntax Error <code>print(2 ; 5)</code></p> <p>(ii) Implicit Type conversion <code>x=10</code> <code>y=20.5</code> <code>print(x+y)</code></p> <p>Note:</p> <ul style="list-style-type: none"> The above examples are just suggestive. Accept all correct examples 	
	<i>(1 Mark for writing each correct example)</i>	
24.	<p>Consider the following dictionaries, D and D1 :</p> <pre>D={"Suman": 40, "Raj":55, "Raman":60} D1={"Aditi":30, "Amit":90,"Raj":20}</pre> <p>(Answer using built-in Python functions only)</p> <p>(i) (a) Write a statement to display/return the value corresponding to the key "Raj" in the dictionary D.</p> <p style="text-align: center;">OR</p> <p>(b) Write a statement to display the length of the dictionary D1.</p> <p>(ii) (a) Write a statement to append all the key-value pairs of the dictionary D to the dictionary D1.</p>	2

	OR	
	(b) Write a statement to delete the item with the given key "Amit" from the dictionary D1.	
Ans	<p>(i) (a) <code>D.get("Raj")</code> # OR <code>D["Raj"]</code> may also be considered</p> <p style="text-align: center;">OR</p> <p>(b) <code>len(D1)</code> # OR <code>len(D1.items())</code> # OR <code>len(D1.keys())</code> # OR <code>len(D1.values())</code></p> <p>(ii) (a) <code>D1.update(D)</code></p> <p style="text-align: center;">OR</p> <p>(b) <code>D1.pop("Amit")</code> # OR <code>del D1["Amit"]</code> # may also be considered</p>	
	<p><i>(i) (1 Mark for writing the correct statement)</i></p> <p><i>(ii) (1 Mark for writing the correct statement)</i></p>	
25.	<p>What possible output from the given options is expected to be displayed when the following code is executed?</p> <pre>import random Cards=["Heart","Spade","Club","Diamond"] for i in range(2): print(Cards[random.randint(1,i+2)],end="#")</pre> <p>(A) Spade#Diamond# (B) Spade#Heart# (C) Diamond#Club# (D) Heart#Spade#</p>	2
Ans	(A) Spade#Diamond#	
	<i>(2 Marks for writing the correct option)</i>	
26.	<p>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.</p> <pre>def Sum(N) for I in range(N): S=S+I return S print(Sum(10))</pre>	2
Ans	<pre>def Sum(N): <u>S=N</u> for I in range(N): S=S+I return S print(Sum(10)) OR</pre>	

	<pre>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))</pre>	
	<p><i>(Full 2 Marks for writing all required corrections)</i></p> <p>OR</p> <p><i>(½ Mark for writing the : after def Sum(N))</i></p> <p><i>(½ Mark for correctly initialising s)</i></p> <p><i>(½ Mark for calculating the correct/required sum s)</i></p> <p><i>(½ Mark for writing the ‘) ’ at the end of print(Sum(10))</i></p> <p>OR</p> <p><i>(1 Mark for only identification of all/any three errors without correction)</i></p>	
27.	<p>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 EMPLOYEEES 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.</p> <p>(i)</p> <p>(a) Help Nisha to identify the attribute which should be designated as the PRIMARY KEY. Justify your answer.</p> <p style="text-align: center;">OR</p> <p>(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.</p>	2
Ans	<p>(i)</p> <p>(a) EMPNO</p> <p>(i) Employee’s Identification Number always contains unique and not null values.</p> <p>(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.</p> <p><i>(Any one valid justification)</i></p> <p style="text-align: center;">OR</p> <p>(b) NOT NULL</p>	
	<p><i>(i) (a)</i></p> <p><i>(½ Mark for suggesting the correct attribute for PRIMARY KEY)</i></p> <p><i>(½ Mark for any one valid justification)</i></p>	

	<p>OR</p> <p>(i) (b) (1 Mark for writing the correct constraint for attribute NAME)</p>	
	<p>(ii)</p> <p>(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.</p> <p style="text-align: center;">OR</p> <p>(b) Write the SQL command to delete the table EMPLOYEES</p>	
Ans	<p>(ii)</p> <p>(a) ALTER TABLE EMPLOYEES MODIFY COLUMN BASICSAL FLOAT (7,2) ; # OR DECIMAL (7,2)</p> <p style="text-align: center;">OR</p> <p>(b) DROP TABLE EMPLOYEES ;</p>	
	<p>(a) <i>(½ Mark for writing ALTER TABLE EMPLOYEES)</i> <i>(½ Mark for correctly writing remaining part of the command)</i></p> <p style="text-align: center;">OR</p> <p>(b) <i>(1 Mark for writing DROP TABLE EMPLOYEES correctly)</i> OR <i>(½ Mark for writing DROP TABLE only)</i></p>	
28.	<p>(a) Expand and explain the term URL.</p> <p style="text-align: center;">OR</p> <p>(b) Expand the term PPP. What is the use of PPP?</p>	2
Ans	<p>(a) URL (Uniform Resource Locator) : It is the unique address of any resource on the Internet.</p> <p style="text-align: center;">OR</p> <p>(b) PPP (Point to Point Protocol) : This protocol is used to establish a dedicated and direct connection between two communicating devices.</p>	
	<p>(a) <i>(1 Mark for writing correct explanation)</i> <i>(1 Mark for writing correct expansion)</i> OR <i>(½ Mark for writing any two words of correct expansion)</i></p> <p style="text-align: center;">OR</p> <p>(b) <i>(1 Mark for writing correct expansion)</i> <i>(1 Mark for writing correct use)</i> OR <i>(½ Mark for writing any two words of correct expansion)</i></p>	

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

	<p>(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 :</p> <p><i>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.</i></p> <p>Then the output should be :</p> <p><i>Once a a awesome able</i></p>			
Ans	<pre>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()</pre> <p>OR</p> <pre>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</pre>			
	<p><i>(½ Mark for opening the file in default/correct mode)</i> <i>(½ Mark for correct reading & iteration)</i> <i>(½ Mark for correct logic to process each word)</i> <i>(1 Mark for correct condition)</i> <i>(½ Mark for displaying word)</i></p>			
30.	<p>(a) A stack, named <code>ClrStack</code>, contains records of some colors. Each record is represented as a tuple containing four elements - <code>ColorName</code>, <code>RED</code>, <code>GREEN</code>, <code>BLUE</code>. <code>ColorName</code> is a string, and <code>RED</code>, <code>GREEN</code>, <code>BLUE</code> are integers. For example, a record in the stack may be (<code>'Yellow'</code>, <code>237</code>, <code>250</code>, <code>68</code>)</p> <p>Write the following user-defined functions in Python to perform the specified operations on <code>ClrStack</code>:</p> <table border="1" data-bbox="284 1816 1369 1951"> <tr> <td data-bbox="284 1816 371 1951">(i)</td> <td data-bbox="371 1816 1369 1951"><code>push_Clr(ClrStack, new_Clr)</code> : This function takes the stack <code>ClrStack</code> and a new record <code>new_Clr</code> as arguments and pushes this new record onto the stack.</td> </tr> </table>	(i)	<code>push_Clr(ClrStack, new_Clr)</code> : This function takes the stack <code>ClrStack</code> and a new record <code>new_Clr</code> as arguments and pushes this new record onto the stack.	3x1 =3
(i)	<code>push_Clr(ClrStack, new_Clr)</code> : This function takes the stack <code>ClrStack</code> and a new record <code>new_Clr</code> 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 .

Ans	<table border="1"> <tr> <td>(i)</td> <td><pre>def push_Clr(ClrStack, new_Clr): ClrStack.append(new_Clr)</pre></td> </tr> <tr> <td>(ii)</td> <td><pre>def pop_Clr(ClrStack): if len(ClrStack) == 0: # OR if not ClrStack: # OR if ClrStack == []: print("Underflow") else: return(ClrStack.pop())</pre></td> </tr> <tr> <td>(iii)</td> <td><pre>def isEmpty(ClrStack): if len(ClrStack) == 0: # OR if not ClrStack: # OR if ClrStack == []: return True else: return False</pre></td> </tr> </table>	(i)	<pre>def push_Clr(ClrStack, new_Clr): ClrStack.append(new_Clr)</pre>	(ii)	<pre>def pop_Clr(ClrStack): if len(ClrStack) == 0: # OR if not ClrStack: # OR if ClrStack == []: print("Underflow") else: return(ClrStack.pop())</pre>	(iii)	<pre>def isEmpty(ClrStack): if len(ClrStack) == 0: # OR if not ClrStack: # OR if ClrStack == []: return True else: return False</pre>
(i)	<pre>def push_Clr(ClrStack, new_Clr): ClrStack.append(new_Clr)</pre>						
(ii)	<pre>def pop_Clr(ClrStack): if len(ClrStack) == 0: # OR if not ClrStack: # OR if ClrStack == []: print("Underflow") else: return(ClrStack.pop())</pre>						
(iii)	<pre>def isEmpty(ClrStack): if len(ClrStack) == 0: # OR if not ClrStack: # OR if ClrStack == []: return True else: return False</pre>						

	<p>(i) <i>(1 Mark for correct definition of push_Clr(ClrStack, new_Clr))</i></p> <p>(ii) <i>(½ Mark for correctly checking and displaying "Underflow")</i> <i>(½ Mark for correctly popping and returning popped tuple/data)</i></p> <p>(iii) <i>(½ Mark for correctly checking whether the Stack is Empty or not)</i> <i>(½ Mark for correctly returning/printing the required values)</i></p>
--	---

	OR		
	(b) Write the following user-defined functions in Python :		
	<table border="1"> <tr> <td>(i)</td> <td>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.</td> </tr> </table>	(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.
(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.		

	<p>(ii) <code>pop_one(myStack)</code>: The function should pop an element from the stack <code>myStack</code>, and return this element. If the stack is empty, then the function should display the message 'Stack Underflow', and return <code>None</code>.</p> <p>(iii) <code>display_all(myStack)</code>: The function should display all the elements of the stack <code>myStack</code>, without deleting them. If the stack is empty, the function should display the message 'Empty Stack'.</p>	
Ans	<p>(b)</p> <p>(i) <code>def push_trail(N,myStack):</code> <code> for i in range(-5,0,1): # Any other correct loop</code> <code> myStack.append(N[i])</code></p> <p>(ii) <code>def pop_one(myStack):</code> <code> if not myStack: #OR if myStack==[]:</code> <code> #OR if len(myStack)==0:</code> <code> print('Stack Underflow')</code> <code> else:</code> <code> return myStack.pop()</code></p> <p>(iii) <code>def display_all(myStack):</code> <code> if not myStack: #OR if myStack==[]:</code> <code> #OR if len(myStack)==0:</code> <code> print("Empty Stack")</code> <code> else:</code> <code> for i in myStack[::-1]: # print(myStack[::-1])</code> <code> print(i,end=' ') # -</code></p>	
	<p>(i) <i>(1 Mark for correct definition of <code>push_trail(N,myStack)</code>)</i></p> <p>(ii) <i>(½ Mark for correctly checking and displaying "Stack Underflow")</i> <i>(½ Mark for correctly popping and returning last element)</i></p> <p>(iii) <i>(½ Mark correctly checking Empty condition)</i> <i>(½ Mark correctly displaying content till the last value in the stack)</i></p>	
31.	<p>(a) Predict the output of the following code :</p> <pre>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</pre>	3

	<pre>newstr = newstr + mystr[:2] print("The new string is:", newstr) ExamOn("GenX")</pre>	
Ans	The new string is: g0n2Ge	
	<p><i>(½ Mark for each correct letter/digit in the right order)</i></p> <p>Note: <i>(2½ Marks only to be awarded, if all the parts of g0n2Ge is written correctly without the text 'The new string is:')</i></p>	
	<p style="text-align: center;">OR</p> <p>(b) Write the output on execution of the following Python code:</p> <pre>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)</pre>	
Ans	<p>Note: Considering two lines after the for loop indented</p> <pre>[1, 2, 3] ['ONE', 'TWO', 'THREE'] {1: 'ONE', 2: 'TWO', 3: 'THREE'}</pre> <p style="text-align: center;">OR</p> <p>Note: Considering only first line after the for loop to be indented</p> <pre>[1, 2, 3] ['THREE'] {1: 'ONE', 2: 'TWO', 3: 'THREE'}</pre>	
	<p><i>(1 Mark for writing each correct line of output)</i></p> <p style="text-align: center;">OR</p> <p><i>(Full 3 Marks for writing indentation error)</i></p>	

SECTION D		(4x4=16)
32.	<p>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 :</p>	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 <code>UPDATE WORKER SET WAGE=1200</code>) (½ Mark for writing <code>WHERE TYPE = "Semiskilled"</code>)													
	OR													
	(b) Considering the above given table <code>WORKER</code> , write the output on execution of the following SQL commands:													
	(i) <code>SELECT WNAME, WAGE*HOURS FROM WORKER WHERE SITEID = 103;</code>													
Ans	<table border="1"> <thead> <tr> <th>WNAME</th> <th>WAGE*HOURS</th> </tr> </thead> <tbody> <tr> <td>Ahmed J</td> <td>300000</td> </tr> <tr> <td>Anju S</td> <td>156000</td> </tr> </tbody> </table>	WNAME	WAGE*HOURS	Ahmed J	300000	Anju S	156000							
WNAME	WAGE*HOURS													
Ahmed J	300000													
Anju S	156000													
	(1 Mark for writing correct output)													
	(ii) <code>SELECT COUNT(DISTINCT TYPE) FROM WORKER ;</code>													
Ans	<table border="1"> <thead> <tr> <th>COUNT(DISTINCT TYPE)</th> </tr> </thead> <tbody> <tr> <td>3</td> </tr> </tbody> </table>	COUNT(DISTINCT TYPE)	3											
COUNT(DISTINCT TYPE)														
3														
	(1 Mark for writing correct output)													
	(iii) <code>SELECT MAX(WAGE), MIN(WAGE), TYPE FROM WORKER GROUP BY TYPE;</code>													
Ans	<table border="1"> <thead> <tr> <th>MAX(WAGE)</th> <th>MIN(WAGE)</th> <th>TYPE</th> </tr> </thead> <tbody> <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> </tbody> </table>	MAX(WAGE)	MIN(WAGE)	TYPE	1500	780	Unskilled	1200	520	Skilled	560	560	Semiskilled	
MAX(WAGE)	MIN(WAGE)	TYPE												
1500	780	Unskilled												
1200	520	Skilled												
560	560	Semiskilled												
	(1 Mark for writing correct output)													
	(iv) <code>SELECT WNAME, SITEID FROM WORKER WHERE TYPE="Unskilled" ORDER BY HOURS;</code>													
Ans	<table border="1"> <thead> <tr> <th>WNAME</th> <th>SITEID</th> </tr> </thead> <tbody> <tr> <td>Jacob B</td> <td>101</td> </tr> <tr> <td>Ahmed J</td> <td>103</td> </tr> </tbody> </table>	WNAME	SITEID	Jacob B	101	Ahmed J	103							
WNAME	SITEID													
Jacob B	101													
Ahmed J	103													
	(1 Mark for writing correct output)													
33.	<p>A csv file "P_record.csv" contains the records of patients in a hospital. Each record of the file contains the following data :</p> <ul style="list-style-type: none"> ● 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)
(1/2 Mark for opening the csv file in correct mode)
(1/2 Mark for reading the records from csv file)
(1/2 Mark for iteration of records)
(1/2 Mark for checking and displaying the matched records correctly)

(ii)
(1/2 Mark for opening the csv file in correct mode)
(1/2 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 :

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

4x1
=4

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 :

- To display all the records from the **Articles** table in descending order of price.
- To display the details of Articles which were created in the year 2020.
- To display the structure of **Artists** table.
- (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;**

	(1/2 Mark for DESC) (1/2 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													
	(1/2 Mark for SELECT Name FROM Articles A1, Artists A2 or similar) (1/2 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													
	(1/2 Mark for selecting from both the tables) (1/2 Mark for correctly using condition/correctly using join option)													
35.	<p>A table, named THEATRE, in CINEMA database, has the following structure :</p> <table border="1"> <thead> <tr> <th>Fields</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>Th_ID</td> <td>char (5)</td> </tr> <tr> <td>Name</td> <td>varchar (15)</td> </tr> <tr> <td>City</td> <td>varchar (15)</td> </tr> <tr> <td>Location</td> <td>varchar (15)</td> </tr> <tr> <td>Seats</td> <td>int</td> </tr> </tbody> </table> <p>Write a function <code>Delete_Theatre()</code>, to input the value of <code>Th_ID</code> from the user and permanently delete the corresponding record from the table.</p> <p>Assume the following for Python-Database connectivity : Host : localhost, User : root, Password : Ex2025</p>	Fields	Type	Th_ID	char (5)	Name	varchar (15)	City	varchar (15)	Location	varchar (15)	Seats	int	4
Fields	Type													
Th_ID	char (5)													
Name	varchar (15)													
City	varchar (15)													
Location	varchar (15)													
Seats	int													
Ans	<pre>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()</pre>													

	<p>OR</p> <pre>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()</pre> <p>OR</p> <p>any equivalent valid code</p>	
	<p><i>(1 Mark for creating correct connectivity)</i> <i>(1 Mark for creating the cursor)</i> <i>(1 Mark for correct formation of Query)</i> <i>(½ Mark for correct execution of the query)</i> <i>(½ Mark for correctly using commit())</i></p> <p>Note: <i>(½ Mark for importing correct module, if the marks allocated are less than 4)</i></p>	
SECTION E		
(2x5=10)		
36.	<p>A file, PASSENGERS.DAT, stores the records of passengers using the following structure :</p> <p style="padding-left: 40px;">[PNR, PName, BRDSTN, DESTN, FARE]</p> <p>where :</p> <p>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)</p> <p>Write user defined functions in Python for the following tasks :</p> <p>(i) Create() – to input data for passengers and write it in the binary file PASSENGERS.DAT.</p> <p>(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.</p> <p>(iii) UpdateFare() - to increase the fare of all passengers by 5% and rewrite the updated records into the file PASSENGERS.DAT.</p>	5

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:
        F=open("PASSENGERS.DAT", "rb")
        Rec=pickle.load(F)
        for R in Rec:
            if R[3]==D:
                print(R)
        F.close()
    except:
        print("File not found!")
```

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)

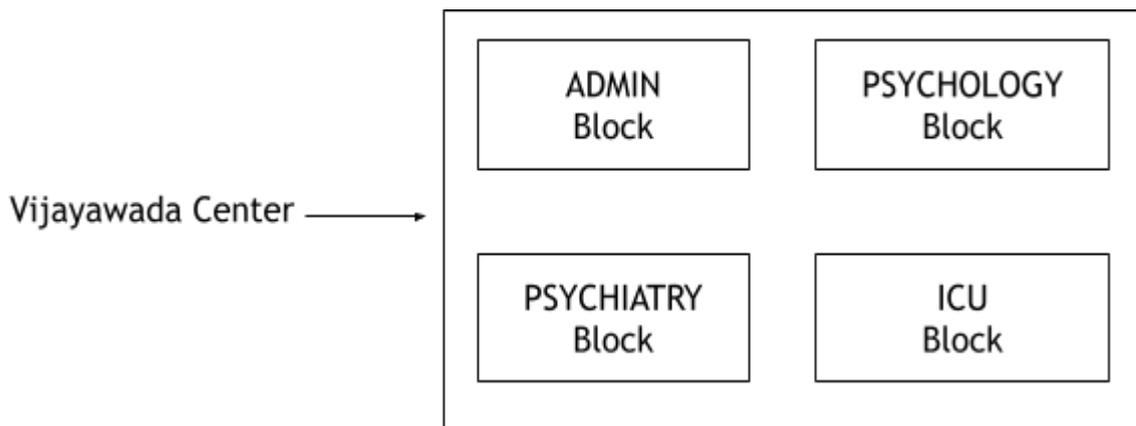
(½ Mark for correctly modifying the Fare)

(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



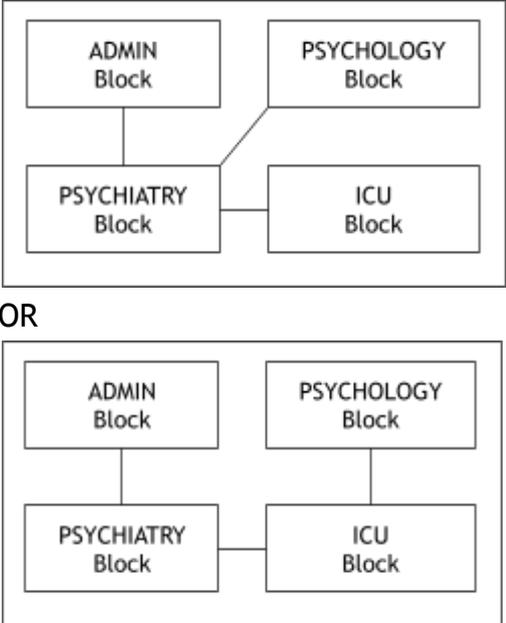
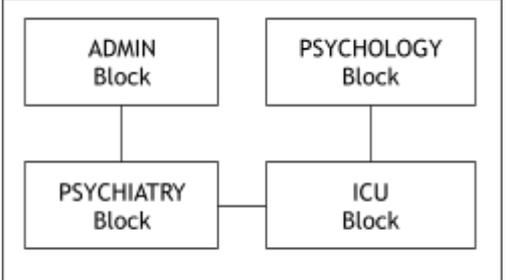
Block to Block distances (in metres) :

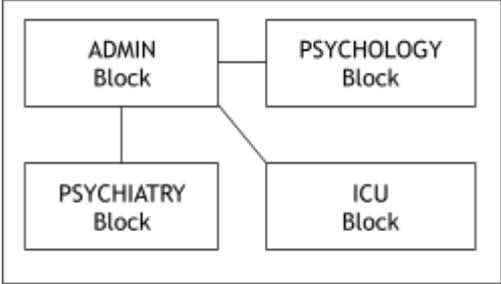
From	To	Distance
ADMIN	PSYCHIATRY	65 m
ADMIN	PSYCHOLOGY	65 m
ADMIN	ICU	65 m
PSYCHIATRY	PSYCHOLOGY	100 m
PSYCHIATRY	ICU	50 m
PSYCHOLOGY	ICU	50 m

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

	<p>(i) Suggest the most appropriate location of the server inside the Vijayawada Center. Justify your choice.</p> <p>(ii) Which hardware device will you suggest to connect all the computers within each block of Vijayawada Center ?</p> <p>(iii) Draw a cable layout to efficiently connect various blocks within the Vijayawada Center.</p> <p>(iv) Where should the router be placed to provide internet to all the computers in the Vijayawada Center?</p> <p>(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 ?</p>	
Ans	<p>(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.</p>	
	<p>(1 Mark for suggesting a block with valid justification)</p>	
	<p>(ii) Switch/Hub/Router (Any one)</p>	
	<p>(1 Mark for writing correct answer)</p>	
	<p>(iii)</p>  <p>OR</p>  <p>OR</p>	

	 <p>OR Any other valid efficient cable layout</p>	
	<p><i>(1 Mark for drawing the correct cable layout)</i></p>	
	<p>(iv) Router should be placed where the server is placed.</p> <p>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.</p>	
	<p><i>(1 Mark for writing the correct answer)</i></p>	
	<p>(v) (a) TELNET OR (b) LAN or MAN or WAN (Not PAN)</p>	
	<p>(a) <i>(1 Mark for writing the correct answer)</i> OR (b) <i>(1 Mark for writing the correct answer)</i></p>	