Class: XII Session: 2022-23

Computer Science (083)

Sample Question Paper (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

	SECTION A	
1.	State True or False "Variable declaration is implicit in Python."	1
2.	Which of the following is an invalid datatype in Python? (a) Set (b) None (c)Integer (d)Real	1
3.	Given the following dictionaries `dict_exam={"Exam":"AISSCE", "Year":2023}` `dict_result={"Total":500, "Pass_Marks":165}` Which statement will merge the contents of both dictionaries? a. `dict_exam.update(dict_result)` b. `dict_exam + dict_result` c. `dict_exam.add(dict_result)` d. `dict_exam.merge(dict_result)`	1
4.	Consider the given expression: `not True and False or True` Which of the following will be correct output if the given expression is evaluated? (a) True (b) False (c) NONE (d) NULL	1
5.	Select the correct output of the code: `a = "Year 2022 at All the best"`	1

	a = a.split('2') b = a[0] + ". " + a[1] + ". " + a[3] print (b) (a) Year . 0. at All the best (b) Year 0. at All the best (c) Year . 022. at All the best (d) Year . 0. at all the best	
6.	Which of the following mode in file opening statement results or generates an error if the file does not exist? (a) a+ (b) r+ (c) w+ (d) None of the above	1
7.	Fill in the blank: _____ command is used to remove primary key from the table in SQL. (a) update (b)remove (c) alter (d)drop	1
8.	Which of the following commands will delete the table from MYSQL database? (a) DELETE TABLE (b) DROP TABLE (c) REMOVE TABLE (d) ALTER TABLE	1
9.	Which of the following statement(s) would give an error after executing the following code? S="Welcome to class XII" # Statement 1 print(S) # Statement 2 S="Thank you" # Statement 3 S[0]= '@' # Statement 4 S=S+"Thank you" # Statement 5 (a) Statement 3 (b) Statement 4 (c) Statement 5 (d) Statement 4 and 5	1
10.	Fill in the blank: _____ is a non-key attribute, whose values are derived from the primary key of some other table. (a) Primary Key (b) Foreign Key (c) Candidate Key	1

	(d) Alternate Key	
11.	The correct syntax of seek() is: (a) `file_object.seek(offset [, reference_point])` (b) `seek(offset [, reference_point])` (c) `seek(offset, file_object)` (d) `seek.file_object(offset)`	1
12.	Fill in the blank: The SELECT statement when combined with _____ clause, returns records without repetition. (a) DESCRIBE (b) UNIQUE (c) DISTINCT (d) NULL	1
13.	Fill in the blank: _____is a communication methodology designed to deliver both voice and multimedia communications over Internet protocol. (a) VoIP (b) SMTP (c) PPP (d)HTTP	1
14.	What will the following expression be evaluated to in Python? `print(15.0 / 4 + (8 + 3.0))` (a) 14.75 (b)14.0 (c) 15 (d) 15.5	1
15.	Which function is used to display the total number of records from table in a database? (a) sum(*) (b) total(*) (c) count(*) (d) return(*)	1
16.	To establish a connection between Python and SQL database, `connect()` is used. Which of the following arguments may not necessarily be given while calling `connect()` ? (a) host (b) database (c) user (d) password	1
Q17 and 18 are ASSERTION AND REASONING 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):- If the arguments in function call statement match the number and order of arguments as defined in the function definition, such arguments are called positional arguments. Reasoning (R):- During a function call, the argument list first contains default argument(s) followed by positional argument(s).	1
18.	Assertion (A): CSV (Comma Separated Values) is a file format for data storage which looks like a text file. Reason (R): The information is organized with one record on each line and each field is separated by comma.	1
	SECTION B	
19.	Rao has written a code to input a number and check whether it is prime or not. His code is having errors. Rewrite the correct code and underline the corrections made. `def prime():` `  n=int(input("Enter number to check :: ")` `  for i in range (2, n//2):` `  if n%i=0:` `  print("Number is not prime \n")` `  break` `  else:` `  print("Number is prime \n')`	2
20.	Write two points of difference between Circuit Switching and Packet Switching. **OR** Write two points of difference between XML and HTML.	2
21.	(a) Given is a Python string declaration: `myexam="@@CBSE Examination 2022@@"` Write the output of: `print(myexam[::-2])` (b) Write the output of the code given below: `my_dict = {"name": "Aman", "age": 26}` `my_dict['age'] = 27` `my_dict['address'] = "Delhi"` `print(my_dict.items())`	1 1
22.	Explain the use of 'Foreign Key' in a Relational Database Management System. Give example to support your answer.	2

23.	(a) Write the full forms of the following: (i) SMTP (ii) PPP (b) What is the use of TELNET?	2
24.	Predict the output of the Python code given below: `def Diff(N1,N2):` `  if N1>N2:` `  return N1-N2` `  else:` `  return N2-N1` `NUM= [10,23,14,54,32]` `for CNT in range (4,0,-1):` `  A=NUM[CNT]` `  B=NUM[CNT-1]` `  print(Diff(A,B),'#', end=' ')` OR Predict the output of the Python code given below: `tuple1 = (11, 22, 33, 44, 55 ,66)` `list1 =list(tuple1)` `new_list = []` `for i in list1:` `  if i%2==0:` `  new_list.append(i)` `new_tuple = tuple(new_list)` `print(new_tuple)`	2
25.	Differentiate between count() and count(*) functions in SQL with appropriate example. OR Categorize the following commands as DDL or DML: INSERT, UPDATE, ALTER, DROP	2
	SECTION C	
26.	(a) Consider the following tables - Bank_Account and Branch: Table: Bank_Account	1+2

ACode	Name	Type
A01	Amrita	Savings
A02	Parthodas	Current
A03	Miraben	Current

Table: Branch

ACode	City
A01	Delhi
A02	Mumbai
A01	Nagpur

What will be the output of the following statement?

```
SELECT * FROM Bank_Account NATURAL JOIN Branch;
```

(b) Write the output of the queries (i) to (iv) based on the table, TECH_COURSE given below:

Table: TECH_COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	Animation and VFX	12000	2022-07-02	101
C202	CADD	15000	2021-11-15	NULL
C203	DCA	10000	2020-10-01	102
C204	DDTP	9000	2021-09-15	104
C205	Mobile Application Development	18000	2022-11-01	101
C206	Digital marketing	16000	2022-07-25	103

```
(i)     SELECT DISTINCT TID FROM TECH_COURSE;
(ii)    SELECT TID, COUNT(*), MIN(FEES) FROM
   TECH_COURSE GROUP BY TID HAVING COUNT(TID)>1;
(iii)   SELECT CNAME FROM TECH_COURSE WHERE
 FEES>15000 ORDER BY CNAME;
(iv)    SELECT AVG(FEES) FROM TECH_COURSE WHERE
 FEES BETWEEN 15000 AND 17000;
```

27. Write a method COUNTLINES() in Python to read lines from text file 'TESTFILE.TXT' and display the lines which are not starting with any vowel. [3]

Example:

If the file content is as follows:

An apple a day keeps the doctor away.
We all pray for everyone's safety.
A marked difference will come in our country.

The COUNTLINES() function should display the output as:

The number of lines not starting with any vowel - 1

OR

Write a function ETCount() in Python, which should read each character of a text file "TESTFILE.TXT" and then count and display the count of occurrence of alphabets E and T individually (including small cases e and t too).

Example:

If the file content is as follows:

Today is a pleasant day.
It might rain today.
It is mentioned on weather sites

The ETCount() function should display the output as:
E or e: 6
T or t : 9

28. (a) Write the outputs of the SQL queries (i) to (iv) based on the relations Teacher and Placement given below: 3

Table : Teacher

T_ID	Name	Age	Department	Date_of_join	Salary	Gender
1	Arunan	34	Computer Sc	2019-01-10	12000	M
2	Saman	31	History	2017-03-24	20000	F
3	Randeep	32	Mathematics	2020-12-12	30000	M
4	Samira	35	History	2018-07-01	40000	F
5	Raman	42	Mathematics	2021-09-05	25000	M
6	Shyam	50	History	2019-06-27	30000	M
7	Shiv	44	Computer Sc	2019-02-25	21000	M
8	Shalakha	33	Mathematics	2018-07-31	20000	F

Table : Placement

P_ID	Department	Place
1	History	Ahmedabad
2	Mathematics	Jaipur
3	Computer Sc	Nagpur

```
(i)   SELECT Department, avg(salary) FROM Teacher
      GROUP BY Department;
ii)   SELECT MAX(Date_of_Join),MIN(Date_of_Join) FROM
      Teacher;
ii)   SELECT Name, Salary,  T.Department, Place FROM
      Teacher T, Placement P WHERE T.Department =
      P.Department AND Salary>20000;

iv)   SELECT Name, Place FROM Teacher T, Placement P
```

	`WHERE Gender ='F' AND T.Department=P.Department;` (b) Write the command to view all tables in a database.	
29.	Write a function INDEX_LIST(L), where L is the list of elements passed as argument to the function. The function returns another list named 'indexList' that stores the indices of all Non-Zero Elements of L. For example: If L contains [12,4,0,11,0,56] The indexList will have - [0,1,3,5]	3
30.	A list contains following record of a customer: [Customer_name, Phone_number, City] Write the following user defined functions to perform given operations on the stack named '**status**': (i) Push_element() - To Push an object containing name and Phone number of customers who live in Goa to the stack (ii) Pop_element() - To Pop the objects from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack. For example: If the lists of customer details are: ["Gurdas", "99999999999","Goa"] ["Julee", "8888888888","Mumbai"] ["Murugan","77777777777","Cochin"] ["Ashmit", "1010101010","Goa"] The stack should contain ["Ashmit","1010101010"] ["Gurdas","9999999999"] The output should be: ["Ashmit","1010101010"] ["Gurdas","9999999999"] Stack Empty **OR** Write a function in Python, Push(SItem) where , SItem is a dictionary containing the details of stationary items- {Sname:price}. The function should push the names of those items in the stack who have price greater than 75. Also display the count of elements pushed into the stack. For example: If the dictionary contains the following data:	3

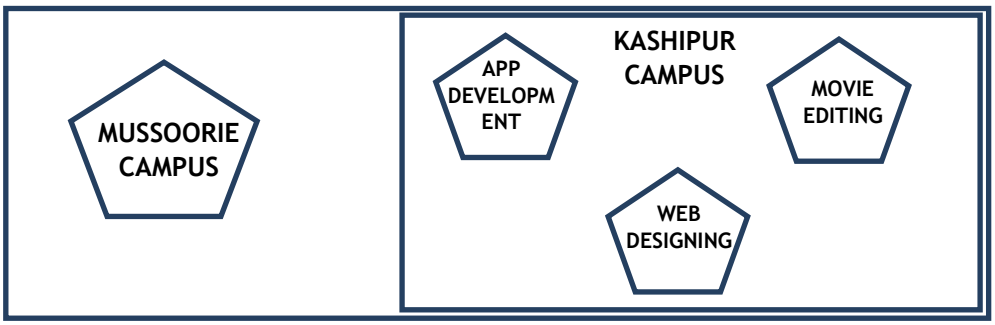
Ditem={"Pen":106,"Pencil":59,"Notebook":80,"Eraser":25}

The stack should contain
Notebook
Pen

The output should be:
The count of elements in the stack is 2

SECTION D

31. MakeInIndia Corporation, an Uttarakhand based IT training company, is planning to set up training centres in various cities in next 2 years. Their first campus is coming up in Kashipur district. At Kashipur campus, they are planning to have 3 different blocks for App development, Web designing and Movie editing. Each block has number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.



Distance between various blocks/locations:

Block	Distance
App development to Web designing	28 m
App development to Movie editing	55 m
Web designing to Movie editing	32 m
Kashipur Campus to Mussoorie Campus	232 km

Number of computers

Block	Number of Computers
App development	75
Web designing	50
Movie editing	80

(i) Suggest the most appropriate block/location to house the SERVER in the Kashipur campus (out of the 3 blocks) to get the best and effective connectivity. Justify your answer. 1

(ii) Suggest a device/software to be installed in the Kashipur Campus to take care of data security. 1

(iii) Suggest the best wired medium and draw the cable layout (Block 1

	to Block) to economically connect various blocks within the Kashipur Campus. (iv) Suggest the placement of the following devices with appropriate reasons: a. Switch / Hub b. Repeater (v) Suggest a protocol that shall be needed to provide Video Conferencing solution between Kashipur Campus and Mussoorie Campus.	1 1
32.	(a) Write the output of the code given below: `p=5` `def sum(q,r=2):` `  global p` `  p=r+q**2` `  print(p, end= '#')` `a=10` `b=5` `sum(a,b)` `sum(r=5,q=1)` (b) The code given below inserts the following record in the table Student: RollNo - integer Name - string Clas - integer Marks - integer Note the following to establish connectivity between Python and MYSQL: • Username is root • Password is tiger • The table exists in a MYSQL database named `school`. • The details (`RollNo, Name, Clas` and `Marks`) are to be accepted from the user. Write the following missing statements to complete the code: Statement 1 - to form the cursor object Statement 2 - to execute the command that inserts the record in the table Student. Statement 3- to add the record permanently in the database **`import mysql.connector as mysql`** **`def sql_data():`** **`  con1=mysql.connect(host="localhost",user="root",`**	2+3

```
password="tiger", database="school")
    mycursor=_____                    #Statement 1
    rno=int(input("Enter Roll Number :: "))
    name=input("Enter name :: ")
    clas=int(input("Enter class :: "))
    marks=int(input("Enter Marks :: "))
    querry="insert into student
values({},'{}',{},{})".format(rno,name,clas,marks)
    _____                             #Statement 2
    _____                             # Statement 3
    print("Data Added successfully")
```

OR

(a) Predict the output of the code given below:

```
s="welcome2cs"

n = len(s)
m=""
for i in range(0, n):
    if (s[i] >= 'a' and s[i] <= 'm'):
        m =   m +s[i].upper()
    elif (s[i] >= 'n' and s[i] <= 'z'):
        m = m +s[i-1]
    elif (s[i].isupper()):
        m = m + s[i].lower()
    else:
        m = m +'&'
print(m)
```

(b) The code given below reads the following record from the table named `student` and displays only those records who have marks greater than 75:

RollNo - integer
Name - string
Clas - integer
Marks - integer

Note the following to establish connectivity between Python and MYSQL:

- **Username is root**
- **Password is tiger**
- **The table exists in a MYSQL database named `school`.**

Write the following missing statements to complete the code:
Statement 1 - to form the cursor object
Statement 2 - to execute the query that extracts records of those students whose marks are greater than 75.
Statement 3- to read the complete result of the query (records whose

marks are greater than 75) into the object named `data`, from the table `student` in the database.

```
import mysql.connector as mysql
def sql_data():

     con1=mysql.connect(host="localhost",user="root",
     password="tiger", database="school")
    mycursor=_________________          #Statement 1
    print("Students with marks greater than 75 are :
")
    ___________________________         #Statement 2
    data=_____________________          #Statement 3
    for i in data:
        print(i)
    print()
```

33. What is the advantage of using a csv file for permanent storage? Write a Program in Python that defines and calls the following user defined functions: 5

(i) ADD() - To accept and add data of an employee to a CSV file 'record.csv'. Each record consists of a list with field elements as `empid`, `name` and `mobile` to store employee id, employee name and employee salary respectively.

(ii) COUNTR() - To count the number of records present in the CSV file named 'record.csv'.

OR

Give any one point of difference between a binary file and a csv file. Write a Program in Python that defines and calls the following user defined functions:

(i) add() - To accept and add data of an employee to a CSV file 'furdata.csv'. Each record consists of a list with field elements as `fid`, `fname` and `fprice` to store furniture id, furniture name and furniture price respectively.

(ii) search()- To display the records of the furniture whose price is more than 10000.

SECTION E

34. Navdeep creates a table RESULT with a set of records to maintain the marks secured by students in Sem 1, Sem2, Sem3 and their division. After creation of the table, he has entered data of 7 students in the table. 1+1+2

ROLL_NO	SNAME	SEM1	SEM2	SEM3	DIVISION
101	KARAN	366	410	402	I
102	NAMAN	300	350	325	I

103	ISHA	400	410	415	I
104	RENU	350	357	415	I
105	ARPIT	100	75	178	IV
106	SABINA	100	205	217	II
107	NEELAM	470	450	471	I

Based on the data given above answer the following questions:

(i) Identify the most appropriate column, which can be considered as Primary key.

(ii) If two columns are added and 2 rows are deleted from the table result, what will be the new degree and cardinality of the above table?

(iii) Write the statements to:

a. Insert the following record into the table
Roll No- 108, Name- Aadit, Sem1- 470, Sem2-444, Sem3-475, Div – I.

b. Increase the SEM2 marks of the students by 3% whose name begins with 'N'.

OR (Option for part iii only)

(iii) Write the statements to:

a. Delete the record of students securing IV division.

b. Add a column REMARKS in the table with datatype as `varchar` with 50 characters

35. Aman is a Python programmer. He has written a code and created a binary file `record.dat` with employeeid, ename and salary. The file contains 10 records.
He now has to update a record based on the employee id entered by the user and update the salary. The updated record is then to be written in the file `temp.dat`. The records which are not to be updated also have to be written to the file `temp.dat`. If the employee id is not found, an appropriate message should to be displayed.
As a Python expert, help him to complete the following code based on the requirement given above:

```
import _______                                  #Statement 1
def update_data():
    rec={}
    fin=open("record.dat","rb")
    fout=open("_____________")                  #Statement 2
    found=False
    eid=int(input("Enter employee id to update their
```

```
salary :: "))
while True:
  try:
    rec=_____________                    #Statement 3
    if rec["Employee id"]==eid:
         found=True
         rec["Salary"]=int(input("Enter new salary
    :: "))
         pickle._____________          #Statement 4
    else:
         pickle.dump(rec,fout)
  except:
    break
if found==True:
  print("The salary of employee id  ",eid,"  has
  been updated.")
else:
  print("No employee with such id is not found")
fin.close()
fout.close()
```

1

(i) Which module should be imported in the program? (Statement 1) 1

(ii) Write the correct statement required to open a temporary file named `temp.dat`. (Statement 2) 2

(iii) Which statement should Aman fill in Statement 3 to read the data from the binary file, `record.dat` and in Statement 4 to write the updated data in the file, `temp.dat`?

Class: XII Session: 2022-23

Computer Science (083)

Sample Question Paper (Theory)

Maximum Marks: 70 **Time Allowed: 3 hours**

	SECTION A ***(1 mark to be awarded for every correct answer)***	
1.	State True or False - "Variable declaration is implicit in Python." **Ans. TRUE**	1
2.	Which of the following is an invalid datatype in Python? (a) Set (b) None (c)Integer (d)Real **Ans: (d) Real**	1
3.	Given the following dictionaries `dict_exam={"Exam":"AISSCE", "Year":2023}` `dict_result={"Total":500, "Pass_Marks":165}` Which statement will merge the contents of both dictionaries? a. `dict_exam.update(dict_result)` b. `dict_exam + dict_result` c. `dict_exam.add(dict_result)` d. `dict_exam.merge(dict_result)` **Ans: (a) `dict_exam.update(dict_result)`**	1
4.	Consider the given expression: `not True and False or True` Which of the following will be correct output if the given expression is evaluated? (a) True (b) False (c) NONE (d) NULL Ans: (a) True	1

5.	Select the correct output of the code: `a = "Year 2022 at All the best"` `a = a.split('2')` `b = a[0] + ". " + a[1] + ". " + a[3]` `print (b)` (a) Year . 0. at All the best (b) Year 0. at All the best (c) Year . 022. at All the best (d) Year . 0. at all the best **Ans: (a) Year . 0. at All the best**	1
6.	Which of the following mode in file opening statement results or generates an error if the file does not exist? (a) `a+` (b) `r+` (c) `w+` (d) None of the above **Ans: (b) r+**	1
7.	Fill in the blank: _____ command is used to remove primary key from a table in SQL. (a) `update` (b)`remove` (c) `alter` (d)`drop` **Ans: (c) `alter`**	1
8.	Which of the following commands will delete the table from MYSQL database? (a) DELETE TABLE (b) DROP TABLE (c) REMOVE TABLE (d) ALTER TABLE Ans: (b) DROP TABLE	1
9.	Which of the following statement(s) would give an error after executing the following code? `S="Welcome to class XII"  # Statement 1` `print(S)  # Statement 2` `S="Thank you"  # Statement 3` `S[0]= '@'  # Statement 4` `S=S+"Thank you"  # Statement 5` (a) Statement 3 (b) Statement 4 (c) Statement 5	1

	(d) Statement 4 and 5 Ans: (b) - Statement 4	
10.	Fill in the blank: _____ is a non-key attribute, whose values are derived from the primary key of some other table. (a) Primary Key (b) Foreign Key (c) Candidate Key (d) Alternate Key **Ans: (b) Foreign Key**	1
11.	The correct syntax of `seek()` is: (a) file_object.seek(offset [, reference_point]) (b) seek(offset [, reference_point]) (c) seek(offset, file_object) (d) seek.file_object(offset) **Ans: (a) `file_object.seek(offset [, reference_point])`**	
12.	Fill in the blank: The SELECT statement when combined with _____ clause, returns records without repetition. (a) `DESCRIBE` (b) `UNIQUE` (c) `DISTINCT` (d) `NULL` **Ans: (c)** `DISTINCT`	
13.	Fill in the blank: _____is a communication methodology designed to deliver both voice and multimedia communications over Internet protocol. (a) VoIP (b) SMTP (c) PPP (d)HTTP **Ans: (a) VoIP**	
14.	What will the following expression be evaluated to in Python? `print(15.0 / 4 + (8 + 3.0))` (a) 14.75 (b)14.0 (c) 15 (d) 15.5	

	Ans: (a) 14.75	
15.	Which function is used to display the total number of records from a table in a database? (a) `sum(*)` (b) `total(*)` (c) `count(*)` (d) `return(*)` **Ans: (c) `count(*)`**	1
16.	To establish a connection between Python and SQL database, `connect()` is used. Which of the following arguments may not necessarily be given while calling `connect()` ? (a) `host` (b) `database` (c) `user` (d) `password` Ans: (b) `- database`	1
Q17 and 18 are ASSERTION AND REASONING 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):- If the arguments in a function call statement match the number and order of arguments as defined in the function definition, such arguments are called positional arguments. Reasoning (R):- During a function call, the argument list first contains default argument(s) followed by positional argument(s). **Ans: (c) A is True but R is False**	1
18.	Assertion (A): CSV (Comma Separated Values) is a file format for data storage which looks like a text file. Reason (R): The information is organized with one record on each line and each field is separated by comma. **Ans: (a) Both A and R are true and R is the correct explanation for A**	1
SECTION B		
19.	Rao has written a code to input a number and check whether it is prime or not. His code is having errors. Rewrite the correct code and underline the corrections made.	2

```
def prime():
   n=int(input("Enter number to check :: ")
   for i in range (2, n//2):
     if n%i=0:
       print("Number is not prime \n")
     break
     else:
       print("Number is prime \n')
```

Ans:

```
def prime():
    n=int(input("Enter number to check :: ")) #bracket missing
    for i in range (2, n//2):
       if n%i==0:                              # = missing
          print("Number is not prime \n")
       __break                                 #wrong indent
       else:
          print("Number is prime \n")          # quote mismatch
```

(½ mark for each correct correction made and underlined.)

20. Write two points of difference between Circuit Switching and Packet Switching. 2

Ans:

Circuit Switching	Packet Switching
Circuit switching is the method of switching which is used for establishing a dedicated communication path between the sender and the receiver.	**Packet switching is the method of switching where no dedicated path is established from the source to the destination.**
Data is processed and transmitted at the source only.	**Data is processed and transmitted, not only at the source but at each switching station.**
It is more reliable.	**It is less reliable.**

(1 mark for each correct point of difference)

OR

Write two points of difference between XML and HTML.

Ans:

XML (Extensible MarkupLangauge)

- XML tags are not predefined, they are user defined
- XML stores and transfers data.
- Dynamic in nature

HTML (Hypertext Markup Langauge)

- HTML tags are pre-defined and it is a markup language
- HTML is about displaying data.
- Static in nature

(1 mark for each correct difference - Any two)

21. a. Given is a Python string declaration:

```
myexam="@@CBSE Examination 2022@@"
```

Write the output of: `print(myexam[::-2])`

Ans: @20 otnmx SC@

(1 mark for the correct answer)

b. Write the output of the code given below:

```
my_dict = {"name": "Aman", "age": 26}
my_dict['age'] = 27
my_dict['address'] = "Delhi"
print(my_dict.items())
```

Ans: dict_items([('name', 'Aman'), ('age', 27), ('address', 'Delhi')])

(1 mark for the correct answer)

22. Explain the use of 'Foreign Key' in a Relational Database Management System. Give example to support your answer.

Ans:

A foreign key is used to set or represent a relationship between two relations (or tables) in a database. Its value is derived from the primary key attribute of another relation.

For example:
In the tables TRAINER and COURSE given below, TID is primary key in TRAINER table but foreign key in COURSE table.

TRAINER

TID	TNAME	CITY	HIREDATE	SALARY
101	Ritu	Nagpur	1998-10-15	56700
102	Navin	Goa	1994-12-24	80000
103	Murugan	Chandigarh	2001-12-21	82000
104	Jyothi	Guwahati	2002-12-25	68000
105	Chanu	Mumbai	1996-01-12	95000

106	Arbaaz	Delhi	2001-12-12	69000	

COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	Deepa	12000	2018-07-02	101
C202	Sindhu	15000	2018-07-15	103
C203	Neeraj	10000	2018-10-01	102
C204	Prakash	9000	2018-09-15	104
C205	Nikhat	20000	2018-08-01	101

(1 mark for explanation and 1 mark for example)
(Any relevant correct example may be marked)

23. (a) Write the full forms of the following: 2
(i) SMTP (ii) PPP

Ans:
(i) SMTP: Simple Mail Transfer Protocol
(ii) PPP: Point to Point Protocol

(½ mark for every correct full form)

(b) What is the use of TELNET?

Ans: TELNET is used to access a remote computer / network.

(1 mark for correct answer)

24. Predict the output of the Python code given below: 2

```
def Diff(N1,N2):
    if N1>N2:
        return N1-N2
    else:
        return N2-N1

NUM= [10,23,14,54,32]
for CNT in range (4,0,-1):
    A=NUM[CNT]
    B=NUM[CNT-1]
    print(Diff(A,B),'#', end=' ')
```

Ans: 22 # 40 # 9 # 13 #

(½ mark for the correct digit with a #)

OR

Predict the output of the Python code given below:

```
tuple1 = (11, 22, 33, 44, 55 ,66)
list1 =list(tuple1)
new_list = []
for i in list1:
    if i%2==0:
        new_list.append(i)
new_tuple = tuple(new_list)
print(new_tuple)
```

Ans: (22,44,66)

(½ mark for each correct digit , ½ mark for enclosing in parenthesis)

25. Differentiate between COUNT() and COUNT(*) functions in SQL with appropriate example. 2

Ans:
COUNT(*) returns the count of all rows in the table, whereas COUNT () is used with Column_Name passed as argument and counts the number of non-NULL values in a column that is given as argument.

Example: Table : EMPL

EMPNO	ENAME	JOB	SAL	DEPTNO
8369	SMITH	CLERK	2985	10
8499	ANYA	NULL	9870	20
8566	AMIR	SALESMAN	8760	30
8698	BINA	MANAGER	5643	20
8912	SUR	NULL	3000	10

e.g. SELECT COUNT(*) FROM EMPL;
Output

COUNT(*)
5

e.g.2 SELECT COUNT(JOB) FROM EMPL;
Output

COUNT(JOB)
3

Since JOB has 2 NULL values

(1 mark for the difference and 1 mark for appropriate example)

OR

Categorize the following commands as DDL or DML:
INSERT, UPDATE, ALTER, DROP

Ans:
DDL- ALTER, DROP
DML - INSERT, UPDATE

(½ mark for each correct categorization)

SECTION C

26. (a) Consider the following tables – Bank_Account and Branch: 1+2

Table: Bank_Account

ACode	Name	Type
A01	Amrita	Savings
A02	Parthodas	Current
A03	Miraben	Current

Table: Branch

ACode	City
A01	Delhi
A02	Mumbai
A01	Nagpur

What will be the output of the following statement?

```
SELECT * FROM Bank_Account NATURAL JOIN Branch;
```

Ans:

Acode	Name	Type	City
A01	Amrita	Savings	Delhi
A01	Amrita	Savings	Nagpur
A02	Parthodas	Current	Mumbai

(1 mark for correct output)

(b) Write the output of the queries (i) to (iv) based on the table, TECH_COURSE given below:

Table: TECH_COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	Animation and VFX	12000	2022-07-02	101
C202	CADD	15000	2021-11-15	NULL

C203	DCA	10000	2020-10-01	102
C204	DDTP	9000	2021-09-15	104
C205	Mobile Application Development	18000	2022-11-01	101
C206	Digital marketing	16000	2022-07-25	103

(i) `SELECT DISTINCT TID FROM TECH_COURSE;`

Ans:

DISTINCT TID
101
NULL
102
104
103

(½ mark for the correct output)

(ii)
```
SELECT TID, COUNT(*), MIN(FEES) FROM TECH_COURSE
GROUP BY TID HAVING COUNT(TID)>1;
```

Ans:

TID	COUNT(*)	MIN(FEES)
101	2	12000

(½ mark for the correct output)

(iii)
```
SELECT CNAME FROM TECH_COURSE WHERE FEES>15000
ORDER BY CNAME;
```

Ans:

CNAME
Digital marketing
Mobile Application Development

(½ mark for the correct output)

(iv)
```
SELECT AVG(FEES) FROM TECH_COURSE WHERE FEES
BETWEEN 15000 AND 17000;
```

Ans:
15500.00

(½ mark for the correct output)

27.	Write a method COUNTLINES() in Python to read lines from text file 'TESTFILE.TXT' and display the lines which are not starting with any vowel.	3

Example:

If the file content is as follows:

An apple a day keeps the doctor away.
We all pray for everyone's safety.
A marked difference will come in our country.

The COUNTLINES() function should display the output as:
The number of lines not starting with any vowel - 1

Ans:

```
def COUNTLINES() :
    file = open ('TESTFILE.TXT', 'r')
    lines = file.readlines()
    count=0
    for w in lines :
        if (w[0]).lower() not in 'aeoiu'
            count = count + 1
    print ("The number of lines not starting with any
vowel: ", count)
    file.close()

COUNTLINES()
```

(½ mark for correctly opening and closing the file
½ for readlines()
½ mar for correct loop
½ for correct if statement
½ mark for correctly incrementing count
½ mark for displaying the correct output)

OR

Write a function ETCount() in Python, which should read each character of a text file "TESTFILE.TXT" and then count and display the count of occurrence of alphabets E and T individually (including small cases e and t too).

Example:

If the file content is as follows:

Today is a pleasant day.
It might rain today.
It is mentioned on weather sites

The ETCount() function should display the output as:
The number of E or e: 6
The number of T or t : 9

Ans:

```
def ETCount() :
```

```
file = open ('TESTFILE.TXT', 'r')
lines = file.readlines()
countE=0
countT=0
for w in lines :
    for ch in w:
        if ch in 'Ee':
            countE = countE + 1
        if ch in 'Tt':
            countT=countT + 1
print ("The number of E or e : ", countE)
print ("The number of T or t : ", countT)
file.close()
```

(½ mark for correctly opening and closing the file
½ for readlines()
½ mark for correct loops
½ for correct if statement
½ mark for correctly incrementing counts
½ mark for displaying the correct output)

Note: Any other relevant and correct code may be marked

28. (a) Write the outputs of the SQL queries (i) to (iii) based on the relations Teacher and Placement given below: — 3

Table : Teacher

T_ID	Name	Age	Department	Date_of_join	Salary	Gender
1	Arunan	34	Computer Sc	2019-01-10	12000	M
2	Saman	31	History	2017-03-24	20000	F
3	Randeep	32	Mathematics	2020-12-12	30000	M
4	Samira	35	History	2018-07-01	40000	F
5	Raman	42	Mathematics	2021-09-05	25000	M
6	Shyam	50	History	2019-06-27	30000	M
7	Shiv	44	Computer Sc	2019-02-25	21000	M
8	Shalakha	33	Mathematics	2018-07-31	20000	F

Table : Placement

P_ID	Department	Place

1	History	Ahmedabad
2	Mathematics	Jaipur
3	Computer Sc	Nagpur

(i) SELECT Department, avg(salary) FROM Teacher GROUP BY Department;

Ans:

Department	Avg(Salary)
Computer Sc	16500.00
History	30000.00
Mathematics	25000.00

(½ mark for the correct output)

(ii) SELECT MAX(Date_of_Join),MIN(Date_of_Join) FROM Teacher;

Ans:

Max(Date_of_Join)	Min(Date_of_Join)
2021-09-05	2017-03-04

(½ mark for the correct output)

(iii)SELECT Name, Salary, T.Department, Place FROM Teacher T, Placement P WHERE T.Department = P.Department AND Salary>20000;

Ans:

Name	Salary	Department	Place
Randeep	30000	Mathematics	Jaipur
Samira	40000	History	Ahmedabad
Raman	25000	Mathematics	Jaipur
Shyam	30000	History	Ahmedabad
Shiv	21000	Computer Sc	Nagpur

(½ mark for the correct output)

(iv)SELECT Name, Place FROM Teacher T, Placement P WHERE Gender='F' and T.Department=P.Department;

Ans:

Name	Place
Samira	Ahmedabad
Suman	Ahmedabad
Shalaka	Jaipur

	(½ mark for the correct output) (b) Write the command to view all tables in a database. Ans: `SHOW TABLES;` *(1 mark for correct answer)*	
29.	Write a function INDEX_LIST(L), where L is the list of elements passed as argument to the function. The function returns another list named `indexList` that stores the indices of all Non-Zero Elements of L. For example: If L contains [12,4,0,11,0,56] The indexList will have - [0,1,3,5] **Ans:** `def INDEX_LIST(L):` `  indexList=[]` `  for i in range(len(L)):` `  if L[i]!=0:` `  indexList.append(i)` `  return indexList` *(½ mark for correct function header* *1 mark for correct loop* *1 mark for correct if statement* *½ mark for return statement)* Note: Any other relevant and correct code may be marked	3
30.	A list contains following record of a customer: [Customer_name, Phone_number, City] Write the following user defined functions to perform given operations on the stack named **status**: (i) Push_element() - To Push an object containing name and Phone number of customers who live in Goa to the stack (ii) Pop_element() - To Pop the objects from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack. For example: If the lists of customer details are:	3

	[“Gurdas”, “99999999999”,”Goa”] [“Julee”, “8888888888”,”Mumbai”] [“Murugan”,”77777777777”,”Cochin”] [“Ashmit”, “1010101010”,”Goa”] The stack should contain [“Ashmit”,”1010101010”] [“Gurdas”,”9999999999”] The output should be: [“Ashmit”,”1010101010”] [“Gurdas”,”9999999999”] Stack Empty **Ans:** `status=[]` `def Push_element(cust):` `  if cust[2]=="Goa":` `  L1=[cust[0],cust[1]]` `  status.append(L1)` `def Pop_element ():` `  num=len(status)` `  while len(status)!=0:` `  dele=status.pop()` `  print(dele)` `  num=num-1` `  else:` `  print("Stack Empty")` *(1.5 marks for correct push_element() and 1.5 marks for correct pop_element())* **OR** Write a function in Python, Push(SItem) where , SItem is a dictionary containing the details of stationary items- {Sname:price}. The function should push the names of those items in the stack who have price greater than 75. Also display the count of elements pushed into the stack. For example: If the dictionary contains the following data: Ditem={"Pen":106,"Pencil":59,"Notebook":80,"Eraser":25} The stack should contain Notebook Pen The output should be:	

The count of elements in the stack is 2

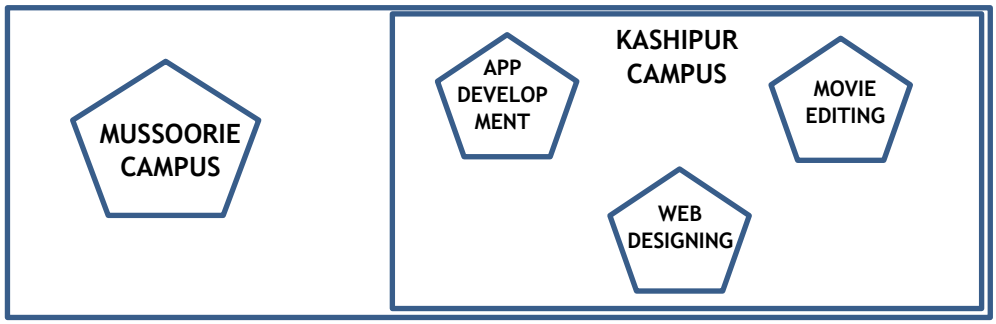
Ans:

```
stackItem=[]
def Push(SItem):
    count=0
    for k in SItem:
        if (SItem[k]>=75):
            stackItem.append(k)
            count=count+1
    print("The count of elements in the stack is :  ",
count)
```

(1 mark for correct function header
1 mark for correct loop
½ mark for correct If statement
½ mark for correct display of count)

SECTION D

31. MakeInIndia Corporation, an Uttarakhand based IT Training company, is planning to set up training centres in various cities in next 2 years. Their first campus is coming up in Kashipur district. At Kashipur campus, they are planning to have 3 different blocks for App development, Web designing and Movie Editing. Each block has number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.



Distance between various blocks/locations:

Block	Distance
App development to Web designing	28 m
App development to Movie editing	55 m
Web designing to Movie editing	32 m
Kashipur Campus to Mussoorie Campus	232 km

Number of computers

Block	Number of Computers
App development	75
Web designing	50
Movie editing	80

(i) Suggest the most appropriate block/location to house the SERVER in the Kashipur campus (out of the 3 blocks) to get the best and effective connectivity. Justify your answer. 1

Ans: Movie editing block is the most appropriate to house the server as it has the maximum number of computers.

(1/2 mark for naming the server block and ½ mark for correct reason.)

(ii) Suggest a device/software to be installed in the Kashipur Campus to take care of data security. 1

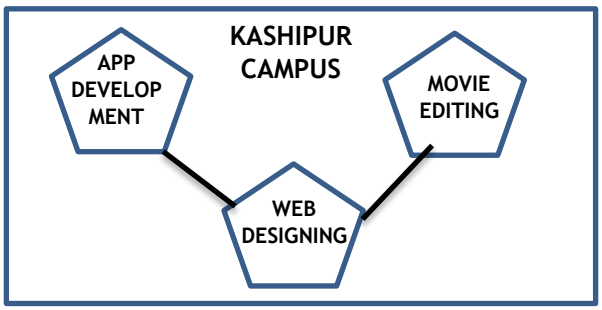
Ans: Firewall

(1 mark for the correct answer)

(iii) Suggest the best wired medium and draw the cable layout (Block to Block) to economically connect various blocks within the Kashipur Campus. 1

Ans: Ethernet Cable

Layout:



(½ mark correct wired medium , ½ mark for layout)

(iv) Suggest the placement of the following devices with appropriate reasons: 1

a. Switch / Hub
b. Repeater

Ans: Switch/hub will be placed in all blocks to have connectivity within the block.

	Repeater is not required between the blocks as the distances are less than 100 mts. **(1 mark for the correct answer)** (v) Suggest the protocol that shall be needed to provide Video Conferencing solution between Kashipur Campus and Mussoorie Campus. **Ans: Protocol: VoIP** **(1 mark for the correct answer)**	1
32.	(a) Write the output of the code given below `p=5` `def sum(q,r=2):` `  global p` `  p=r+q**2` `  print(p, end= '#')` `a=10` `b=5` `sum(a,b)` `sum(r=5,q=1)` Ans: Output: 105#6# *(1 mark for 105# and 1 mark for 6#)* (b) The code given below inserts the following record in the table Student: RollNo - integer Name - string Clas - integer Marks - integer Note the following to establish connectivity between Python and MYSQL: • Username is root • Password is tiger • The table exists in a MYSQL database named `school`. • The details (`RollNo`, `Name`, `Clas` and `Marks`) are to be accepted from the user. Write the following missing statements to complete the code: Statement 1 - to form the cursor object	2+3

Statement 2 - to execute the command that inserts the record in the table Student.
Statement 3- to add the record permanently in the database

```
import mysql.connector as mysql
def sql_data():
    con1=mysql.connect(host="localhost",user="root",
password="tiger", database="school")
    mycursor=_____________________          #Statement 1
    rno=int(input("Enter Roll Number :: "))
    name=input("Enter name :: ")
    clas=int(input("Enter class :: "))
    marks=int(input("Enter Marks :: "))
    querry="insert into student
values({},'{}',{},{})".format(rno,name,clas,marks)
    _____________________________          #Statement 2
    _____________________________          # Statement 3
    print("Data Added successfully")
```

Ans:

Statement 1:

```
con1.cursor()
```

Statement 2:

```
mycursor.execute(querry)
```

Statement 3:

```
con1.commit()
```

(1 mark for each correct answer)

OR

(a) Predict the output of the code given below:

```
s="welcome2cs"

n = len(s)
m=""
for i in range(0, n):
    if (s[i] >= 'a' and s[i] <= 'm'):
        m =   m +s[i].upper()
    elif (s[i] >= 'n' and s[i] <= 'z'):
        m = m +s[i-1]
    elif (s[i].isupper()):
        m = m + s[i].lower()
    else:
        m = m +'&'
print(m)
```

Ans:
sELCcME&Cc

(1 mark for first 5 characters, 1 mark for next 5 characters)

(b) The code given below reads the following record from the table named `student` and displays only those records who have marks greater than 75:
RollNo - integer
Name - string
Clas - integer
Marks - integer

Note the following to establish connectivity between Python and MYSQL:

- **Username is root**
- **Password is tiger**
- **The table exists in a MYSQL database named `school`.**

Write the following missing statements to complete the code:
Statement 1 - to form the cursor object
Statement 2 - to execute the query that extracts records of those students whose marks are greater than 75.
Statement 3- to read the complete result of the query (records whose marks are greater than 75) into the object named `data`, from the table `student` in the database.

```
import mysql.connector as mysql
def sql_data():

     con1=mysql.connect(host="localhost",user="root",passwo
     rd="tiger", database="school")
    mycursor=_________________                    #Statement 1
    print("Students with marks greater than 75 are : ")
    ____________________________                  #Statement 2
    data=_____________________                    #Statement 3
    for i in data:
        print(i)
    print()
```

Ans:
Statement 1:
`con1.cursor()`

Statement 2:
`mycursor.execute("select * from student where Marks>75")`

Statement 3:
`mycursor.fetchall()`

	(1 mark for each correct statement)	
33.	What is the advantage of using a csv file for permanent storage? Write a Program in Python that defines and calls the following user defined functions: a) ADD() - To accept and add data of an employee to a CSV file 'record.csv'. Each record consists of a list with field elements as `empid, name` and `mobile` to store employee id, employee name and employee salary respectively. b) COUNTR() - To count the number of records present in the CSV file named 'record.csv'. **Ans:** **Advantage of a csv file:** • **It is human readable - can be opened in Excel and Notepad applications** • **It is just like text file** **Program:** `import csv` `def ADD():` `fout=open("record.csv","a",newline="\n")` `wr=csv.writer(fout)` `empid=int(input("Enter Employee id :: "))` `name=input("Enter name :: ")` `mobile=int(input("Enter mobile number :: "))` `lst=[empid,name,mobile] ---------1/2 mark` `wr.writerow(lst) ---------1/2 mark` `fout.close()` `def COUNTR():` `fin=open("record.csv","r",newline="\n")` `data=csv.reader(fin)` `d=list(data)` `print(len(d))` `fin.close()` `ADD()` `COUNTR()` `(1 mark for advantage` `½ mark for importing csv module` `1 ½ marks each for correct definition of ADD() and COUNTR()` `½ mark for function call statements` `)`	5

OR

Give any one point of difference between a binary file and a csv file.
Write a Program in Python that defines and calls the following user defined functions:

a) add() - To accept and add data of an employee to a CSV file 'furdata.csv'. Each record consists of a list with field elements as `fid`, `fname` and `fprice` to store furniture id, furniture name and furniture price respectively.

b) search()- To display the records of the furniture whose price is more than 10000.

Ans:
Difference between binary file and csv file: (Any one difference may be given)
Binary file:

- **Extension is .dat**
- **Not human readable**
- **Stores data in the form of 0s and 1s**

CSV file

- **Extension is .csv**
- **Human readable**
- **Stores data like a text file**

Program:

```
import csv
def add():
    fout=open("furdata.csv","a",newline='\n')
    wr=csv.writer(fout)
    fid=int(input("Enter Furniture Id :: "))
    fname=input("Enter Furniture name :: ")
    fprice=int(input("Enter price :: "))
    FD=[fid,fname,fprice]
    wr.writerow(FD)
    fout.close()

def search():
    fin=open("furdata.csv","r",newline='\n')
    data=csv.reader(fin)
    found=False
    print("The Details are")
    for i in data:
        if int(i[2])>10000:
            found=True
            print(i[0],i[1],i[2])
    if found==False:
        print("Record not found")
```

```
    fin.close()
add()
print("Now displaying")
search()


(1 mark for difference
½ mark for importing csv module
1 ½  marks each for correct definition of add() and
search()
½ mark for function call statements
)
```

SECTION E

34. Navdeep creates a table **RESULT** with a set of records to maintain the marks secured by students in Sem 1, Sem2, Sem3 and their division. After creation of the table, he has entered data of 7 students in the table. 1+1+2

Table: RESULT

ROLL_NO	SNAME	SEM1	SEM2	SEM3	DIVISION
101	KARAN	366	410	402	I
102	NAMAN	300	350	325	I
103	ISHA	400	410	415	I
104	RENU	350	357	415	I
105	ARPIT	100	75	178	IV
106	SABINA	100	205	217	II
107	NEELAM	470	450	471	I

Based on the data given above answer the following questions:

i. Identify the most appropriate column, which can be considered as Primary key.

Ans: ROLL_NO

(1 mark for correct answer)

ii. If two columns are added and 2 rows are deleted from the table result, what will be the new degree and cardinality of the above table?

Ans:
New Degree: 8
New Cardinality: 5

(1/2 mark for correct degree and ½ mark for correct cardinality)

iii. Write the statements to:

a. Insert the following record into the table – Roll No- 108, Name- Aadit, Sem1- 470, Sem2-444, Sem3-475, Div – I.

b. Increase the SEM2 marks of the students by 3% whose name begins with 'N'.

Ans:

a. **INSERT INTO RESULT VALUES (108, 'Aadit', 470, 444, 475, 'I');**

b. **UPDATE RESULT SET SEM2=SEM2+ (SEM2*0.03) WHERE SNAME LIKE "N%";**

(1 mark for each correct statement)

OR (Option for Part iii only)

iii. Write the statements to:

a. Delete the record of students securing IV division.

b. Add a column REMARKS in the table with datatype as varchar with 50 characters

Ans:

a. **DELETE FROM RESULT WHERE DIV='IV';**

b. **ALTER TABLE RESULT ADD (REMARKS VARCHAR(50));**

(1 mark for each correct statement)

35. Aman is a Python programmer. He has written a code and created a binary file `record.dat` with employeeid, ename and salary. The file contains 10 records.
He now has to update a record based on the employee id entered by the user and update the salary. The updated record is then to be written in the file `temp.dat`. The records which are not to be updated also have to be written to the file `temp.dat`. If the employee id is not found, an appropriate message should to be displayed.
As a Python expert, help him to complete the following code based on the requirement given above:

```
import _______                                    #Statement 1
def update_data():
    rec={}
    fin=open("record.dat","rb")
    fout=open("_____________")                    #Statement 2
    found=False
    eid=int(input("Enter employee id to update their salary
    :: "))
    while True:
      try:
        rec=_____________                          #Statement 3
        if rec["Employee id"]==eid:
             found=True
```

```
            rec["Salary"]=int(input("Enter new salary ::
        "))
            pickle._____                    #Statement 4
        else:
            pickle.dump(rec,fout)
    except:
      break
  if found==True:
    print("The salary of employee id  ",eid,"  has been
    updated.")
  else:
    print("No employee with such id is not found")
 fin.close()
 fout.close()
```

(i) Which module should be imported in the program? (Statement 1) — 1

Ans: pickle

(1 mark for correct module)

(ii)Write the correct statement required to open a temporary file named `temp.dat` for writing the updated data. (Statement 2) — 1

Ans: fout=open('temp.dat', 'wb')

(1 mark for correct statement)

(iii) Which statement should Aman fill in Statement 3 to read the data from the binary file, `record.dat` and in Statement 4 to write the updated data in the file, `temp.dat`? — 2

Ans: **Statement 3: pickle.load(fin)**
Statement 4: pickle.dump(rec,fout)

(1 mark for each correct statement)