

Total No. of Printed Pages—8

**HS/XII/A.Sc.Com/IP/NC/20**

**2 0 2 0**

**INFORMATICS PRACTICES**

( New Course )

*Full Marks : 70*

*Time : 3 hours*

*The figures in the margin indicate full marks for the questions*

*General Instructions :*

- (i) Write all the answers in the Answer Script.
- (ii) Attempt multiple choice questions and very short answer-type questions serially.
- (iii) Attempt all parts of a question together at one place.

**1.** Choose the correct option for the following questions :

1×6=6

(a) Given an ndarray  $N$  having elements 3, 4, 5. What will be the result produced by the statement  $N \times 3$ ?

- (i) [3, 4, 5, 3, 4, 5, 3, 4, 5]
- (ii) array([9, 12, 15])
- (iii) array([3, 4, 5, 3, 4, 5, 3, 4, 5])
- (iv) [3, 4, 5]

- (b) Which one of the following statements returns an error while importing 'Pyplot' interface of 'Matplotlib' library?
- (i) `import matplotlib.pyplot`
  - (ii) `import matplotlib.pyplot as plt`
  - (iii) `from matplotlib import pyplot as plt`
  - (iv) `from matplotlib.pyplot as plt`
- (c) Which of the following is not the software process model?
- (i) The waterfall model
  - (ii) Evolutionary model
  - (iii) Incremental Delivery model
  - (iv) Component-based model
- (d) In a use-case diagram, actor is represented by
- (i) stick figure
  - (ii) oval
  - (iii) plain line
  - (iv) rectangle
- (e) Which SQL statement allows you to find the highest 'price' (column) from the table 'Book'?
- (i) `SELECT Maximum(price) FROM Book;`
  - (ii) `SELECT MAX(price) FROM Book;`
  - (iii) `SELECT COUNT(price) FROM Book;`
  - (iv) Both (i) and (ii)

( 3 )

(f) Excessive use of Internet affects the mental health of a person, such condition is termed as \_\_\_\_\_ by doctors.

- (i) cybercrime
- (ii) identity theft
- (iii) Internet addiction
- (iv) online stealing

**2.** Answer the following questions in brief : 1×5=5

- (a) What are NumPy arrays?
- (b) Define software engineering.
- (c) What is Agile software development?
- (d) Suggest the type of systems for which you will recommend spiral model.
- (e) What is the use of ORDER BY clause in SQL SELECT statement?

**3.** Answer the following questions : 2×5=10

- (a) List two points of difference between ndarrays and Python lists.
- (b) Consider the following ndarray  $X$  and write down result returns by the statement  $\rightarrow \text{print}(X[0:2, 0:2])$  :

`array([[0, 1, 2, 3], [4, 5, 6, 7], [8, 9, 10, 11], [12, 13, 14, 15]])`

Or

Predict the output of the following code fragments.  
Note that library 'NumPy' has been imported as 'np' :

```
X = np.array([1, 2, 3])
Y = np.array([3, 2, 1])
Z = np.concatenate([X, Y])
print(Z)
```

( 4 )

- (c) Explain `hstack()` and `vstack()` functions.
- (d) What are quantiles and quartiles?
- (e) Consider the following code segments and write down the output. Note that library **pandas** has been imported as **pd** :

```
D2 = {'Name' : ['Ajay', 'John', 'Riya'],  
      'Age'  : [16, 17, 18],  
      'Address': ['Mumbai', 'Shillong', 'Delhi']}  
Dfd = pd.DataFrame(D2)  
P = Dfd.Sort_values(['Address'])  
print(P)
```

4. Answer the following questions : 2×3=6

- (a) Briefly explain the various elements of Use-Case diagram.

*Or*

Draw a simple use-case diagram depicting a bank ATM system.

- (b) List the four guidelines of Agile manifesto.
- (c) What are software requirements?

5. Answer the following questions : 2×3=6

- (a) Explain about HTTP GET request and POST request in a web client-server architecture.

*Or*

How can you activate virtual environment for Django project?

( 5 )

- (b) **Satyam Joshi** is using a table 'Employee'. It has the following columns (fields) :

emp\_code, emp\_name, emp\_salary and dept\_code

He wants to display number of employees from each department. He wrote the following command :

```
SELECT dept_code COUNT(emp_code) FROM Employee;
```

But he did not get the desired result.

Rewrite the above query with necessary changes to help him get the desired output.

- (c) What is the difference between a **WHERE** clause and a **HAVING** clause of SQL SELECT statement?

6. Answer the following questions :

3×3=9

- (a) Given following ndarray Ary1 ([[1, 2, 3], [4, 5, 6], [7, 8, 9]]). What will be the output produced by the following array slices?

(i) Ary1 [:2, :3]

(ii) Ary1 [:3, ::2]

(iii) Ary1 [::-1, ::-1]

Or

Explain the functions array(), fromiter() and arange() in brief.

( 6 )

(b) Rohan has following set of data :

<i>Year</i> <i>Month</i>	2016	2017	2018	2019
Jan	10	15	10	15
Feb	20	20	15	20
Mar	30	30	20	30
April	40	45	25	25

He wants to calculate mean, mode and median along axis=1. Help him to do the operations by writing the suitable functions by supplying sufficient arguments.

(c) What is a line graph? Which function is used for drawing a line graph in Python using Pyplot interface of Matplotlib library? How can you add title and axes names for line graph?

7. Suppose, you have created a Django project namely 'School'. It contains three apps in it :

(a) Admission

(b) Exam

(c) Fees

What will be the structure of Django project folder? Only list the folders, do not list any file inside app folders.

3

Or

What is the use of ORDER BY clause? Write a query that sorts the data of table 'student' on the basis of Project-Group (in ascending order), Section (in descending order), Marks (in descending order).

3

( 7 )

**8.** Answer the following questions : 3×3=9

- (a) What are online scams? What measures will you take to avoid online scams?
- (b) What role has new age media played in things like online campaigns, crowdsourcing and smart mobs?

*Or*

What is computer forensics? What important practices are followed in computer forensics?

- (c) How can you protect yourself against identity theft?

**9.** Answer the following questions : 4×2=8

- (a) How can you obtain contiguous and non-contiguous subsets from an ndarray? Explain with the help of examples.
- (b) What is meant by function application? Explain the function application functions `pipe()`, `apply()` and `applymap()`.

*Or*

How is `pivot()` function different from `pivot_table()` function? Explain with the help of examples.

**10.** What are the advantages and disadvantages of waterfall model? 4

*Or*

Discuss pair programming in detail.

**11.** Write a Python code to connect to a MySQL database namely 'Bank' and then fetch all those records from the table 'employee' where salary>40,000. 4

( 8 )

Or

Given the following table :

Table : CLUB

Coach_ID	Coach_Name	Age	SPORTS	DateOfApp	Pay	Sex
1	Kukreja	35	Karate	27/03/1996	1000	M
2	Ravina	34	Karate	20/01/1998	1200	F
3	Karan	34	Squash	19/02/1998	2000	M
4	Tarun	33	Basketball	01/01/1998	1500	M
5	Zubin	36	Swimming	12/01/1998	750	M
6	Ketaki	36	Swimming	24/02/1998	800	F
7	Ankita	39	Squash	20/02/1998	2200	F
8	Zareen	37	Karate	22/02/1998	1100	F
9	Kush	41	Swimming	13/01/1998	900	M
10	Shailya	37	Basketball	19/02/1998	1700	M

Give the output of the following SQL statements :

(a) SELECT COUNT (DISTINCT SPORTS) FROM CLUB;

(b) SELECT MIN (Age) FROM CLUB WHERE Sex='F';

(c) SELECT AVG (Pay) FROM CLUB WHERE  
SPORTS='Karate';

(d) SELECT SUM (Pay) FROM CLUB WHERE  
DateOfApp > '31/01/1998';

★ ★ ★