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FOR MEGHALAYA CLASS 12 PREPARATION

MBOSE Class 12 Sample Question Paper 2027 Informatics Practices

EXAM	YEAR	TYPE	SUBJECT
Meghalaya Class 12	2027	Sample Paper	Informatics Practices

Sample Question Paper
Subject: Informatics Practice
Class – XII
Full Marks: 70 Time: 3 Hours

General Instructions:

1. This Question paper contains 37 questions.
2. All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
3. The examination paper is divided into 5 sections: Sections A, B, C, D, E.
4. Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
5. Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
6. Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
7. Section D consists of 2 questions (33 to 34). Each question carries 4 Marks.
8. Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
9. All programming questions are to be answered using Python Language only.
10. In case of MCQ, text of the correct answer should also be written.

Q. No.	Question	Marks
	Section-A (21x1=21 Marks)	
1.	State True or False: List and tuple can be easily converted into Series by Series ( ) method.	1
2.	What will be the output of the given code? import pandas as pd D=pd.Series([1,2,3,4,5], index=[‘akram’, ‘brijesh’, ‘charu’, ‘deepika’, ‘eral’]) Print(D[‘charu’]) (a) 1 (b) 2 (c) 3 (d) 4	1
3.	Which graph should be used where each column represents a range of values and the height of a column corresponds to how many values are in that range? (a) Line (b) plot (c) histograms (d) bar	1
4.	For series objects, S.head( ) will display (a) Generator error (b) First element of series (c) Top five elements of series (d) All elements of series	1
5.	Axis-1 identifies a dataframe’s _____ (a) rows (b) columns (c) values (d) datatypes	1

6.	What will be output of print(df.loc[:]) (a) Display 'Error' (b) Display 'All columns for all rows' (c) Display 'First Five rows' (d) Display 'only the indexes'	1
7.	Write the attributes to find the number of bytes and number of elements in a series object S.	1
8.	What will be returned by the given query? SELECT INSTR('INDIA', 'DI'); a) -3 b) 3 c) 2 d) -2	1
9.	Which of the following SQL function is used to count the non-NULL values in a column named age? (a) COUNT(*) (b) COUNT(age) (c) SUM(age) (d) AVG (age)	1
10.	_____ helps to find a group of rows based on common values in a column. (a) Group BY (b) FILTER (c) Order by (d) SELECT BY	1
11.	What will be the order of the data being sorted after the execution of the given query? SELECT * FROM STUDENT ORDER BY ROLL-NO; (a) Descending (b) Sequential (c) Custom Sort (d) Ascending	1
12.	What is digital footprint?	1
13.	The SQL built-in function _____ obtains the largest value in a numeric column.	1
14.	A/An _____ is a specific type of join that uses only equality comparisons in the join-condition.	1
15.	What is wrong with the following statement? SELECT * FROM EMPLOYEE WHERE grade =NULL;	1
16.	State True or False: The device used to connect two networks using different protocols is called Gateway.	1
17.	In which type of topology, network components are connected to the same cable? (a) Star (b) Bus (c) Ring (d) Mesh	1
18.	What do you understand by the term URL?	1
19.	Data which has no restriction of usage and is freely available to everyone under Intellectual Property Rights is categorized as: (a) Open Source (b) Open Data	1

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	(c) Open Content (d) Open Education	
	Q-20 and Q-21 are Assertion (A) and Reason (R) Type questions. Choose the correct option as: a) Both A and R are True, and R correctly explains A. b) Both A and R are True, but R does not correctly explain A. c) A is True, but R is False. d) A is False, but R is True.	
20.	Assertion (A): The INSERT command is a DML(Data Manipulation Language) command. Reason (R): DML commands are used to insert, update or delete the data stored in a database.	1
21.	Assertion (A): DataFrame has both a row and column index. Reason (R): A DataFrame is a two-dimentional labelled data structure like a table of MySQL.	1
	Section-B (7x2=14 Marks)	
22.	How is series data structure different from a DataFrame data structure?	2
23.	(A) Complete the given Python Code to get the required output as: Rajasthan. import _____ as pd di={'corbett': 'uttarakhand','Sariska':'Rajasthan' , 'Kanha':'Madhya Pradesh','Gir': 'Gujarat'} NP=_____ . Series (_____) print (NP[_____]) OR (B) Write a python program to plot a line chart based on the given data to depict the changing weekly average temperature in Delhi for four weeks. Week=[1234] temp=[40,42,38,44]	2 2
24.	Write a program to read records from a CSV file Employee.csv and create a dataframe from it but dataframe should not use file's column header rather should use own column number as 0,1,2 and so on.	2
25.	(A) What is the role of NOT NULL Constraint and Primary Key Constraint? OR (B) Write down the result return by the following query: I. SELECT MOD (11,4): II. SELECT SUBSTRING ('Quadratically', 5,6);	2 1 1
26.	(A) Differentiate between web browser and web server. OR (B) What is meant by network topology? List any two popular topology.	2 2
27.	(A) Mary, a class XI student, has written code for a website but is unsure how to make it available on the Internet. Explain to Mary the role of a web server and web hosting in ensuring availability of her website on the internet.	2

OR

(B) Explain the concept of VoIP and mention one benefit of using it. 1½ +½=2

28. What measures should you take to keep your data secure? 2

SECTION-C (4x3=12 Marks)

29. (A) Consider the two code fragments given below. 1½+ 1½=3
Will they produce the same output? Why/Why not?

(I)
```
fst = [9,10,11]
ob1 = pd.Series(data=fst*2)
print(ob1)
```

(II)
```
fst = pd.Series(data=[9,10,11])
ob2 = pd.Series(data=fst*2)
print(ob2)
```

OR

(B) Given a Dataframe 'df' as shown below:

	A	B	C
0	21	12	69
1	45	45	84
2	23	86	70
3	17	33	78

What will be the result of the following code statements? 1+1+1=3

(a) df['D'] = np.nan
(b) df['D']=[23,41,32]
(c) df['D']=[23,41,32,9]

30. (A) Consider the following table EMPLOYEE, which stores Employee ID, Name, Department and Salary. 1+1+1=3

Table: EMPLOYEE

EmployeeID	Name	Department	Salary
101	Aman	IT	60000
102	Rahul	HR	50000
103	Priya	IT	70000
104	Neha	Finance	55000
105	Rahul	IT	60000

I. Which attribute in the Table can be considered as the Primary Key? Provide justification for your answer.
II. Write a suitable SQL query to add a new column, 'Experience', of numerical data type to the table.
III. Write the output of the following SQL query.

```
SELECT Department, COUNT(*) FROM Employee GROUP By
    Department;
```

OR

(B) Write the SQL statements to do the following: 1+1+1=3
I. To view the structure of 'Empl' table.
II. To view the existing databases
III. To add a column 'mobile-No' in the table 'Empl'.

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<table>
<tr><td>31.</td><td>(A) What is the significance of GROUP By clause in SQL query? What is the difference between WHERE clause and HAVING clause of SQL SELECT statement?

OR

(B) Write the difference between UPDATE and ALTER commands with examples.</td><td>3

3</td></tr>
<tr><td>32.</td><td>(A) What is e-waste? Explain any two harmful effects of improper disposal of e-waste.

OR

(B) Write any three differences between software and open source software.</td><td>1x3=3

3</td></tr>
<tr><td></td><td>SECTION-D (4x2=8 Marks)</td><td></td></tr>
<tr><td>33.</td><td>(A) Medal Tally Commonwealth Games 2018 for India.
<table>
<tr><td>Country</td><td>Gold</td><td>Silver</td><td>Bronze</td><td>Total</td></tr>
<tr><td>India</td><td>26</td><td>20</td><td>20</td><td>66</td></tr>
</table>
Write a program to create a horizontal bar chart for India’s Medal Tally. Write an appropriate title and both axis labels. Also give suitable Python Statement to save this chart.

OR

(B) The height of 10 students of eight grade are given below:
Height (cms)= [145,141,142,143,144,141,140,143,144]. Write a suitable Python code to generate a histogram, based on the given data, along with an appropriate chart title and both axis labels. Also give suitable python statement to save this chart.</td><td>4

4</td></tr>
</table>

34. (A) Consider the following table 'STUDENT': 1x4=4

ST_NO	CLASS	NAME	GAME	G_GRADE	SUPW	S_GRADE
10	7	Karan	Cricket	B	Photography	A
11	8	Arun	Tennis	A	Gardening	C
12	7	Divya	Swimming	B	Photography	B
13	7	Sabina	Tennis	C	Cooking	A
14	9	Veena	Basketball	A	Literature	A
15	10	John	Cricket	A	Gardening	C

Write the SQL commands for the following:

(i) Display the number of students getting grade 'A' in cricket.

(ii) Display the names of the students who are getting grade 'C' in either GAME or SUPW.

(iii) Display the SUPW taken up by the students, whose name starts with 'A'.

(iv) Insert a new record into the table 'STUDENT' with random values.

OR

(B) Consider the following table and write the output of the following SQL Queries. 1x4=4

Table: Student

StudentID	Name	DOB	Marks	City
301	Aryan	15-03-2005	88	Delhi
302	Ayesha	NULL	90	NULL
304	Aditi	NULL	85	Pune
305	Rajesh	11-01-2006	72	NULL
306	Maria	29-04-2005	95	Chennai

Write the output of the following SQL Queries.

(i) SELECT Name, LENGTH(Name) FROM Student WHERE StudentID < 303;

(ii) SELECT lower(Name) FROM Student WHERE MONTH(Date of Birth)= 3

(iii) SELECT AVG(Marks) FROM Student;

(iv) SELECT Name, Marks FROM Student WHERE Marks BETWEEN 90 AND 100;

SECTION-E (3x5=15 Marks)

35. Consider the dataframe DF as shown below: 1x5=5

Name	Department	Age
Ankit Sharma	IT	29
Neha Mehta	HR	32
Priya Kumari	Finance	41
Kabir Khanna	Sales	35
Manav Kapoor	Marketing	28

Write Python statements for the following tasks:

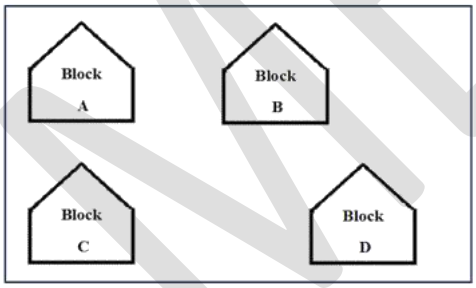
(i) Display the **first two rows** of the Dataframe.

(ii) Add a new column named "Salary" with values [75000,68000,82000,70000,65000]

(iii) Delete the column "Age" from the DataFrame.

(iv) Rename the column "Department" to "Dept".

(v) Display only the "Name" and "Dept" columns from the DataFrame.

	OR (B) Consider the following codes and figure out what these are trying to do. The Pandas library has been imparted as pd. (i) pd.read_csv("data.csv",nrows=20) (ii) pd.read_csv("data.csv",skiprows=[1,2,3,4]) (iii) pd.read_csv("data.csv",header=None) (iv) pd.read_csv("data.csv",sep='@') (v) pd.read_csv("data.csv",index_col='Ename')	1x5=5
36.	(A) Write suitable SQL queries for the following: (i) Count the characters in the string 'Artificial Intelligence' (ii) Find the position 'i' in the column named **Topic of The Seminars** table. (iii) Square the **duration** column in the **Session** table (iv) Display the average rating from the **Rating** column in the **Reviews** table. (v) Display the total rating from the **Rating** column in the **Reviews** table. OR (B) Write the SQL functions which will perform the following operations: (i) To display the name of the weekday for your date of birth. (ii) To convert e-mail-id to lowercase. (iii) To count the number of characters in your name. (iv) To display the first character of your name. (v) To calculate the average marks secured by the class.	1x5=5 1x5=5
37.	Read the text carefully and answer the questions: **Knowledge supplement** organization has setup its new centre at Bangalore for its office and web-based activities. It has 4 blocks of buildings as shown in the diagram below:  ***Centre to centre distances between various blocks:*** Block A to Block B: 50m Block B to Block C: 150m Block C to Block D: 25m Block A to Block D: 170m Block B to Block D: 125m Block A to Block C: 90m The number of computers in each block is as follows: Block A: 25 Block B: 50 Block C: 125 Block D: 10	5

	As a network engineer, you have to propose solutions for various queries listed from (i) to (v). (i) Suggest cable layout of connections between the blocks. (ii) Suggest the most suitable place (i.e. block) to house the server of this organization with suitable reason. (iii) Suggest the placement of the following devices with justification: (a) Repeater (b) Hub/Switch (iv) The organization is planning to link its front office situated in the city in a hilly region, where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed. (v) What is the use of gateway in networking?	

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