BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
MID-TERM EXAMINATION 2023-24

INFORMATICS PRACTICES (065)

Class : XII SCIENCE/COMMERCE/ARTS   Duration : 3 Hrs
Date   : 16-10-2023   Max. Marks : 70
Admission No.:   Roll No.:

General Instructions:

1. This question paper contains four sections, Section A to D.

2. All questions are compulsory.

3. Section A has 18 MCQ and 10 Very Short Answer type questions carrying 01 mark each.

4. Section B has 11 Short Answer type questions carrying 02 marks each.

5. Section C has 05 Long Answer type Answer questions carrying 03 marks each.

6. Section D has 01 Very Long Answer type questions carrying 05 mark each.

7. All programming questions are to be answered using Python Language only.

Section-A

1. To create an empty Series object, you can use :   1
   (a) pd.Series(empty)   (b) pd.Series(np.NaN)   (c) pd.Series( )   (d) All of these

2. To get top 5 rows of a DataFrame, you may use _____ function.   1
   (a) head( )   (b) top( )   (c) top(5)   (d) None of these

3. Which of the following functions is used to import data from a CSV file into a DataFrame?   1
   (a) read_csv()   (b) to_csv()   (c) write_csv()   (d) import_csv()

4. Which of the following parameters is used to specify the separator character used in the CSV   1
   file?
   (a) header   (b) sep   (c) index_col   (d) na_values

5. Which of the following keywords will we use in the following query to display the unique   1
   values of the column dept_name ?
   SELECT _____ dept_name FROM Company ;
   (a) All   (b) From   (c) Distinct   (d) Name

6. Which of the following is not a numeric function ?   1
   (a) Mod   (b) Sign   (c) Mid   (d) Pow

7. By default, ORDER BY clause lists the results in _____ order.   1
   (a) Descending   (b) Any   (c) Same   (d) Ascending

8. What will be returned by the given query ?   1
   Select INSTR("INFORMATICS","FORM");
   (a) 2   (b) 3   (c) -2   (d) -3

9. Hub is a :   1
   (a) Broadcast device   (b) Unicast device   (c) Multicast device   (d) None of the above

10. Internet is an example of _____ topology.   1
    (a) Star   (b) Bus   (c) Mesh   (d) Ring

11. URL stands for: 1
    (a) Universal Resource Locator   (b) Universal Resource Location
    (c) Uniform Resource Locator   (d) None of the above

12. Every activity you perform on the Internet is saved for how long ? 1
    (a) one month   (b) one year   (c) as per my setting   (d) forever

13. In which type of join, the join condition contains an equality operator ? 1
    (a) Equijoin   (b) Natural   (c) Left Join   (d) Right Join

14. Switch is a : 1
    (a) Broadcast device   (b) Unicast device   (c) Multicast device   (d) None of the above

15. By default, ORDER BY clause lists the results in _____ order. 1
    (a) Descending   (b) Any   (c) Same   (d) Ascending

16. Where and Having clauses can be used interchangeably in SELECT queries ? 1
    (a) True   (b) False   (c) Only in views   (d) With order by

17. When you visit a website, it will open the page set as ____ of the website. 1
    (a) Web site   (b)Home page   (c) Email   (d) ISP

18. IP stands for: 1
    (a) Internet Protocol   (b) Intranet Protocol   (c) Internet Provider   (d) Internet Package

19. Given are two objects, a list object namely **list1** and a Series object **Ser1**, both are having similar values i.e., 2, 4, 6, 8. Find out the output produced by following statements:
    (a) print(Ser1 * 2) 1

20. Name a function to iterate over a DataFrame horizontally. 1

21. What functions does Pandas provide to handle missing data ? 1

22. Consider the following program and answer any the questions: 1

    (a) import _____ as plt
    (b) plt._____ ('Vertical Bar Chart')

23. Assertion: The to_csv() function can be used to export a DataFrame to a CSV file. 1
    Reason: The to_csv() function is a built-in function in the pandas library that can be used to export a DataFrame to a CSV file. Is the assertion true ?

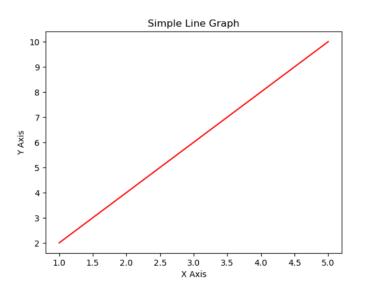24. Stealing someone else's intellectual work and representing it as own, is called _____. 1

Write SQL commands for the following queries (a) to (d) based on table/relation Teacher.

Table: Teacher

T_ID	Name	Age	Department	Date_of_Join	Salary	Gender
1	Jugal	34	Computer Sci	10-01-2017	12000	M
2	Sharmila	31	History	24-03-2008	20000	F
3	Sandeep	32	Mathematics	12-12-2016	30000	M
4	Sujata	35	History	01-07-2015	40000	F
5	Rakesh	42	Mathematics	05-09-2007	25000	M
6	Shyam	50	History	27-06-2008	30000	M
7	Shiv Om	44	Computer Sci	25-02-2017	21000	M
8	Shashikala	33	Mathematics	31-07-2018	20000	F

25.	(a) To show all information about the teacher of History department.	1
26.	(b) To list the names of female teachers who are in Mathematics department.	1
27.	(c) To list the names of all teachers with their date of joining in ascending order.	1

28. Write the output of the following SQL commands : **(Any one)**   1
    (a) Select round(49.88);
    (b) Select length("INFORMATICS PRACTICES");
    (c) Select Mod(11,4) "Modulus";

Section-B

29. Create a data series in python and then change the index of the series object.   2
30. Mr. Amit is confused between Series and DataFrame. Help him to understand the difference between the two with examples.   2

31. Write a python program to create a LINE GRAPH as given below   2

Simple Line Graph

32. You have a CSV file with data about students. The file has the following columns: 2
    Name, age, gender, grade
    Write a Python program to import the data from the CSV file into a DataFrame
    and display the complete DataFrame.

33. Write SQL statement to add a column ''COUNTRY'' with data type and size as   2
    VARCHAR(70) to the existing table named ''PLAYER''. Is it a DDL or DML or TCL
    command ?

34. Differentiate between **CHAR** and **VARCHAR** datatype. Give example.   2

35. Write the SQL functions which will perform the following operations :   2
    (a) To display the name of the month of the current date.
    (b) To remove spaces from the beginning and end of a string "Panorama".

36. What is the difference between a WHERE clause and a HAVING clause of SQL SELECT   2
    statement ? Give example.

37. Difference between a Router and Gateway. Give example.   2

38. What are cookies ? What is their utility ?   2

39. Nivedita has recently shifted to a new city and new school .she does not know many people   2
    in her new city and school. But all of sudden, someone is posting negative, demeaning
    comments on her social network profile, school site's forum etc.,
    She is also getting repeated mails from unknown people. Everytime she goes online, she finds
    someone chasing her online.
    1) What is happening to Nivedita ?
    2) What action should she take to stop them ?

Section-C

40. Write a program in python to create a DataFrame using any method like list, dictionary.   3

	A	B	C	D
Acct	99	94.0	92	97.0
Eco	90	94.0	92	97.0
Eng	95	89.0	91	89.0
IP	94	NaN	99	95.0
Math	97	100.0	99	NaN

41. Explain each of the following with illustrations using a table: 3
    (a) Candidate Key   (b) Primary Key   (c) Foreign Key

Table 1: Department

DeptCode	DeptName
001	Science
002	English
005	Computer

Table 2: Teacher

Teacher ID	DeptCode	Fname	Lname
B002	002	David	Warner
B017	002	Sara	Joseph
B009	001	Mike	Brunton

In the table 1, deptcode is the primary and in table 2, it is the foreign key.

Table 3 : Student

StudID	Roll No	First Name	LastName	Email
1	11	Tom	Price	abc@gmail.com
2	12	Nick	Wright	xyz@gmail.com
3	13	Dana	Natan	mno@yahoo.com

In the above table 3 , StudID, RollNo and Email are Candidate keys . But we have selected
StudId as primary Key.

42. Define MySQL function. Name the different types with example.   3

43. Given an array **Rev** storing Revenue of a small business in past some years: 3
Rev= np.array([12, 15, 13, 15, 16, 17, 14, 19, 19, 17, 19, 16, 17, 16, 18, 18, 18, 19, 19, 18, 19,21, 20, 18, 19, 19, 21, 19, 19, 22])
(a) Write code to create a histogram as per following specifications:
▪ Number of bins should be 10.
▪ Plot color should be blue.
▪ Outline/edge color should be red.
(b) Create a step type histogram.

44. Consider the following table and answer the questions that follow: 3
APPLICANTS

NO	NAME	FEE	GENDER	CR_ID	DATEOFJOIN
1012	AMANDEEP	30000	M	A01	2012-01-02
1102	AVISHA	25000	F	A02	2009-03-24
1103	EKANT	30000	M	A03	2011-11-04
1049	ARUN	40000	M	A02	2009-05-06
1025	AMBER	30000	M	A01	2011-11-03

COURSES

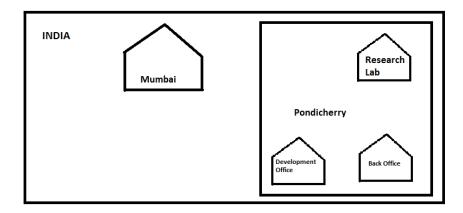| CR_ID	CNAME
A01	DATA MINING
A02	PROGRAMMING
A03	LATHING

a) Identify the Primary Key and Foreign Key in APPLICANTS and COURSES table
b) What is the Cardinality and Degree of APPLICANTS table ?

Section-D

45. "Bias methodologies" is planning to expand their network in India, starting with three cities   5
in India to build infrastructure for research and development of the chemical products. The
company has planned to set up their main office in Pondicherry - at three different locations
and have named their offices as "Back office", "Research lab" and "Development unit". The
company has one more research office namely "Corporate office" in Mumbai. A rough layout
of the same is as follows

Approximate distance between these offices is as follows :

From	To	Distance
Research Lab	Back Office	110 metre
Research Lab	Development Unit	16 Km
Research Lab	Corporate Unit	1800 Km
Back office	Development Unit	13 Km

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

Research Lab	158
Back office	79
Development Unit	90
Corporate Unit	51

(i) Suggest the kind of network required(out of LAN, MAN, WAN) for connecting each of the following office units: Justify it.
-> Research lab and Back office
-> Research lab and Development unit
(ii) Which one of the following devices will you suggest for connecting all the computers in each of their office units ? Justify it.
-> Switch / hub
-> Modem
-> Telephone
(iii) Draw at-least two layouts and name the topology. Calculate the total distance or length of cable Required.

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