

Reg. No.

B.Tech/ M.Tech (Integrated) DEGREE EXAMINATION, MAY 2024

Third Semester

21CSS202T – FUNDAMENTALS OF DATA SCIENCE*(For the candidates admitted from the academic year 2022-2023 onwards)***Note:**

- (i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
- (ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours

Max. Marks: 75

PART – A (20 × 1 = 20Marks)

Marks BL CO PO

Answer **ALL** Questions

- The most important object defined in numpy is an N-dimensional array type called?
(A) ndarray (B) darray
(C) nd_array (D) ndarray
1 1 3 2
- What will be the output of the following code?
import numpy as np
a = np.array ([2,2,3], dtype = complex)
print a
(A) [[2.+0.j, 2.+0.j, 3.+0.j]] (B) [2.+0.j]
(C) Error (D) [2.+0.j, 2.+0.j, 3.+0.j]]
1 2 3 2
- Which of the following is not an application for data science?
(A) Recommendation system (B) Image and speech recognition
(C) Online price comparison (D) Privacy checker
1 1 3 2
- What will be the output?
import numpy as np
a = np.array ([1,2,3,5,8])
b = np.array ([0,3,4,2,1])
c = a * b
c = c + a
print (c[3])
(A) 25 (B) 15
(C) 12 (D) 9
1 2 3 2
- What will be the output:
class fruits:
def __init__(self, price):
self.price = price
obj = fruits (50)
obj . quantity = 10
obj . bags = 2
print (obj. quantity + len (obj. __ dict __))
(A) 12 (B) 52
(C) 13 (D) 60
1 1 2 2

6. The expression `a{5}` will match _____ characters with the previous regular expressions. 1 2 2 2
 (A) 5 or less (B) Exactly 5
 (C) 5 or more (D) Exactly 4
7. What is the purpose of using 'C' in a pdb command? 1 2 2 2
 (A) Display variable (B) Print variable
 (C) Continue (D) Clear the variable
8. The SQLite database management system is a/an _____ database. 1 1 2 2
 (A) Embedded relational (B) Non-embedded relational
 (C) Non- relational (D) Structural
9. Which architectural pattern does DJANGO follow? 1 1 1 2
 (A) MCT (B) MMT
 (C) MVT (D) MVQ
10. Which of the following is the DJANGO shortcut method to more easily render an HTML response? 1 2 1 2
 (A) `render` (B) `render_to_response`
 (C) `response_render` (D) `render_to_html`
11. JSON is a _____ for storing and transporting data. 1 1 1 2
 (A) xml format (B) Text format
 (C) Java script (D) php format
12. DJANGO is written in which language 1 2 1 2
 (A) PHP (B) Python
 (C) Java (D) Perl
13. Function to drop rows with NaN values 1 2 4 2
 (A) `df.drop()` (B) `df.dropna()`
 (C) `df.delete()` (D) `df.deletena()`
14. To count non NaN values of data frame, we can use 1 1 4 2
 (A) `size` (B) `len`
 (C) `count` (D) `values`
15. Which of the following statement will display? `df.iloc[3:7, :4]` 1 1 4 2
 (A) Display 3rd to 7th row and first 4 columns (B) Display 4th to 7th row and first 4 columns
 (C) Display 3rd to 7th row and first 5 columns (D) Display 4th to 7th row and first 5 columns
16. The function to fill in NAN values with 200, if df is the dataframe object 1 2 1 2
 (A) `fillna(200)` (B) `df.fillna(200)`
 (C) `df.fillna(0)` (D) `df.fill(200)`
17. By default `hist()` uses bin value of 1 1 5 2
 (A) 5 (B) 10
 (C) 15 (D) 20

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|--|---|---|---|---|
| 18. Which of the following is used to set the limit of x-axis of the plot? | 1 | 1 | 5 | 2 |
| (A) Limit () | | | | |
| (B) Limits () | | | | |
| (C) Xlimit () | | | | |
| (D) Xlimits () | | | | |
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- | | | | | |
|--|---|---|---|---|
| 19. Which of the following website provides and data freely to download and to do data analysis for educational purpose? | 1 | 2 | 5 | 2 |
| (A) data.gov.in | | | | |
| (B) digitalindia.gov.in | | | | |
| (C) data.mygov.in | | | | |
| (D) csc.gov.in | | | | |
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|--|---|---|---|---|
| 20. The command to install matplotlib library in python is | 1 | 2 | 5 | 2 |
| (A) Install pip matplotlib | | | | |
| (B) Install matplotlib | | | | |
| (C) Pip matplotlib | | | | |
| (D) Pip install matplotlib | | | | |

PART – B (5 × 8 = 40 Marks)

Marks BL CO PO

Answer ALL Questions

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|---|---|---|---|---|
| 21. a. Illustrate in detail about data science process with necessary diagrams. | 8 | 3 | 3 | 2 |
| (OR) | | | | |
| b. Construct a numpy program to partition a given array in a specified position and move all the smaller elements values to the left of the partition and the remaining values to the right in an arbitrary order (based on random choice). | 8 | 4 | 3 | 2 |
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|---|---|---|---|---|
| 22. a. Discuss in detail about unit test module to demonstrate python debugging. | 8 | 3 | 2 | 2 |
| (OR) | | | | |
| b. Write a python class named student with 2 attributes student_roll no and student_name. Add a new attribute student_class. Create a function to display the entire attribute and their values in student class. | 8 | 4 | 2 | 2 |
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- | | | | | |
|--|---|---|---|---|
| 23. a. Illustrate in detail about DJANGO MVT structure with a neat sketch. | 8 | 3 | 1 | 2 |
| (OR) | | | | |
| b. Demonstrate in detail about DJANGO HTTP request and HTTP response. | 8 | 4 | 1 | 2 |
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- | | | | | |
|---|---|---|---|---|
| 24. a. Analyze different arithmetic, logical and filtering operation on data frame. | 8 | 4 | 4 | 2 |
| (OR) | | | | |
| b. Show in detail about indexing and multi-indexing concepts in Pandas. | 8 | 3 | 4 | 2 |
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- | | | | | |
|---|---|---|---|---|
| 25. a. Construct programs to visualize the data frame in matplotlib and seaborn. | 8 | 3 | 5 | 2 |
| (OR) | | | | |
| b. Predict the different univariate visualization for categorical data with assumption of a relevant dataset. | 8 | 4 | 5 | 2 |

PART – C (1 × 15 = 15 Marks)

Marks BL CO PO

Answer ANY ONE Question

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|---|----|---|---|---|
| 26. Construct a calorie tracker app using DJANGO. | 15 | 3 | 1 | 2 |
|---|----|---|---|---|

27. Solve the following by considering the numpy array given below:

15 4 4 2

```
import numpy
```

```
y = numpy.array ([[4,6,8,12], [15,13,18,21], [27,30,33,36], [39,42,45,48],  
                 [51,54,57,60]])
```

- (i) Return the array of elements in the third column (from all rows)
- (ii) Return a sub-array comprising of odd rows and even columns of the above array
- (iii) Build a new array from the above array swapping first and last, second and third columns
- (iv) Swap rows and columns in reverse order
- (v) Sum of elements

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