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End Semester Examination 2024

Name of the Course: BCA

Semester: 4th

Name of the Paper: Data Analytics using Python

Course Code: TBC-401

Time: 3 Hours

Maximum Marks: 100

Note:

- All Questions are compulsory.
- Answer any two sub questions among a,b and c in each main question.
- Total marks in each main question are twenty.
- Each question carries 10 marks.

Q1	(10 X2 = 20 Marks)														
(a)	What do you understand by data science and data analytics? Discuss the various areas where data analytics is applied.		CO1												
(b)	What do you understand by data analysis? Why is it important? Explain its types and data analysis process in detail.														
(c)	What do you understand by data and information? Define types of data with suitable examples.														
Q2	(10 X2 = 20 Marks)														
(a)	Consider the following data set of experience and salary of five employees. Compute the y-intersect and slope of the best-fitting line for linear regression: <table><tr><th>Experience</th><th>Salary</th></tr><tr><td>10</td><td>21</td></tr><tr><td>14</td><td>33</td></tr><tr><td>12</td><td>27</td></tr><tr><td>10</td><td>22</td></tr><tr><td>8</td><td>23</td></tr></table>		Experience	Salary	10	21	14	33	12	27	10	22	8	23	CO2
Experience	Salary														
10	21														
14	33														
12	27														
10	22														
8	23														
(b)	What is sample, population and sampling? Explain sampling techniques in detail with the help of examples.														
(c)	A rowing team consists of four rowers who weigh 152,156,160 and 164 pounds. Find all possible random samples with replacement of size two and compute the sample mean for each one. Use them to find the probability distribution, the mean and the standard deviation of the sample mean.														
Q3	(10 X2 = 20 Marks)														
(a)	What is tuple and dictionary? Write a python program to calculate salary of a person based on number of days and salary per day. Also deduct 5% PF from salary.		CO3												
(b)	What are mutable and immutable data types in python? Write a python program to change n th element of list with n+1 th element.														
(c)	What do you understand by operators? Explain different types of operators. Also write the operator's precedence from highest to lowest.														
Q4	(10 X2 = 20 Marks)														
(a)	How we can create a class and make its object in python. Why 'self' is used with every method of a class. Discuss the importance of init() constructor in python programming.		CO4												
(b)	How a lambda function is different from a user-defined function. Explain the concept and usage of following functions: map, reduce and filter.														
(c)	What is the concept behind using a loop? In how many ways we can use a loop in python. Explain the Indentation Error occurred in a python program.														
Q5	(10 X2 = 20 Marks)														
(a)	What are pandas in python? How data frames are created in python. Explain with suitable examples.		CO5												
(b)	Explain indexing and slicing in a NumPy 1D and 2D array with an example. Write the output for the following: (i) import numpy as np														

	<pre> (ii) import numpy as np arr = np.array([[[1, 2, 3], [4, 5, 6]], [[7, 8, 9], [10, 11, 12]]]) for x in arr: print(x) (iii) import numpy as np arr = np.array([[1, 2, 3, 4], [5, 6, 7, 8]]) for x in np.nditer(arr[:, ::2]): print(x) (iv) import numpy as np arr = np.array([1, 2, 3, 4, 5, 6]) newarr = np.array_split(arr, 4) print(newarr) (v) import numpy as np arr = np.array([1, 3, 5, 7]) x = np.searchsorted(arr, [2, 4, 6]) print(x) </pre>	
(c)	What is the need of visualization? How visualization takes place in Python? Explain in detail with the help of suitable functions.	