PES UNIVERSITY	**PES University, Bengaluru** (Established under Karnataka Act No. 16 of 2013)	**UE20CS901**

AUGUST 2021: END SEMESTER ASSESSMENT (ESA)
M TECH DATA SCIENCE AND MACHINE LEARNING_ SEMESTER I

UE20CS901 - Python for Data Science

Time: 3 Hrs	Answer All Questions	Max Marks: 80

1	a)	What are the Immutable built-in datatypes of Python Explain the feature immutable with suitable code.	2
	b)	Explain negative indexing in Python	2
	c)	What is a string and explain slicing of string?	2
	d)	What are map and reduce functions in Python?	2
	e)	Is python statically typed or dynamically typed? Explain.	2
2	a)	Define significant features of pandas library.	2
	b)	Explain categorical data in pandas.	2
	c)	What is the difference between matrices and arrays?	2
	d)	How to create a multi-dimensional array using 1-D array? Explain the method.	2
	e)	What is the difference between sort_values() and sort_indexes() for Pandas Series?	2
3	a)	For a given nested list find out the minimum element and calculate average of all elements. Use the given list? list1 = [[20,25,30],24,56,[10,15,18],[12,45,20],35,20,23,28]	10

	b)	Write a Python program to help a candidate to choose the interview in a job fair. The job fair starts at 08:00 and ends at 17:00. You have to register once for the fair and you can appear for selection process of all companies. You are given the start time and end time of each company. Help the candidate to choose the companies, so that it can appear for maximum companies. Company data - Company Name - Start Time - End Time Data Vision - 8:00 - 9:00 InfoWorld - 8:00 - 9.30 Data Wide - 8.10 - 9.40 Analyticpoint - 8.15 - 9.30 TradeData - 10.00 - 11.30 Panini View - 10.30 - 11.00 Skyview - 11.00 - 11.30 Data Magnet - 11.30 - 14.30 Clean View - 13.30 - 14.00 InfoGrade - 14.00 - 15.30 Secureit - 15.00 - 17.00 Top Gain - 15.30 - 16.00 Fizo - 16.00 - 17.00	15

		Also discuss the approach to find the solution.	
	c)	Write a Python program verify that every number in the list is even? Implement using user defined functions and map-reduce.	5
4	a)	Solve the following using the dataset given #### Dataset Description #### ##### This is a covid patient's dataset 1. pid. - Govt assignd patient id. 1 Age - Age of the patient. 2 Sex - Gender of the patient 3 cp - criticality of the patient 4 trtbps - resting blood pressure (in mm Hg) 5 chol - cholestoral in mg/dl fetched via BMI sensor 6 fbs - (fasting blood sugar > 120 mg/dl) 7 restecg - resting electrocardiographic results 8 thalachh - maximum heart rate achieved 9 Addiction - Alcohol, Nicotine, Drug and other with their types 10 keratin_type - Keratin Type 11 Diabetestype - Diabetes_type 12 Hemoglobin - Hemoglobin level in blood 13 blood_grp - blood group level of pateint 14 Immunity - Immunity level 1,2,3 where 1 is highest immunity level 15 Affected_portion_lungs - Affected portion of lungs 16 Breath_ratio - Breath ration of petient 17 Survive_status Survival status of petient (Survived / Passed Away) 1. Convert the following columns value type into categorical 'cp', 'fbs', 'restecg', 'keratin_type', 'Immunity' (4 marks)	15

		2. Drop the Patient id column. (2 marks) 3. Plot an appropriate diagram to visualize the Age distribution over different blood_group type. Comment on your observation. (Marks 3) 4. Plot an appropriate diagram to visualize the relationship between Age & thalachh. Comment on your observation. (Marks 3) 5. Display the unique values in addiction column. How many different addiction types are mentioned in dataset (3 Marks)	
	b)	Use Covid dataset to solve following 1. Display a cross table with Diabetes type and survived status. Calculate the percentage survival ratio for each type of diabetes and update the cross table accordingly. Write your inference (6 Marks) 2. Calculate average Hemoglobin level for male and female separately. Count the number of male and female with Hemoglobin less than 10 (4 Marks) 3. Check the distribution of trtbps, take number of bins as 20 (2 Marks) 4. Check the distribution of chol, take number of bins as 20. Write your comments(3 Marks)	15