Name: **Enrolment No:**	UPES UNIVERSITY OF TOMORROW

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2024

Course: Advanced Statistics — **Semester: IV**
Program: BBA-ABD — **Time: 03 hrs.**
Course Code: DSQT-2004 — **Max. Marks: 100**

SECTION A
10Qx2M=20Marks

1.	**Select correct answer**	**Marks**	**CO**
	(i) What is the primary purpose of a scatter diagram? A) To show the relationship between two variables B) To display categorical data C) To demonstrate cause and effect D) To calculate correlation coefficients	2	CO1
	(ii) Partial correlation measures: A) The strength of a relationship between two variables while controlling for the effect of one or more other variables B) The correlation between two variables with no control for other variables C) The correlation between two categorical variables D) The correlation between dependent and independent variables	2	CO1
	(iii) Which of the following is an example of a discrete random variable? A) Height of a person B) Temperature outside C) Number of students in a classroom D) Weight of a watermelon	2	CO1
	(iv) The expectation of a random variable represents: A) The most frequent outcome B) The average outcome over many repetitions of the random experiment C) The highest possible outcome D) The lowest possible outcome	2	CO1
	(v) Sampling is: A) The process of selecting a subset of individuals from a population to represent the entire population B) The process of collecting data from the entire population C) The process of organizing data in a systematic manner D) The process of analyzing data to draw conclusions	2	CO1

	(vi) What is the purpose of using index numbers? A) To calculate probabilities in statistics B) To measure changes in the value of a variable over time C) To identify outliers in a dataset D) To determine the correlation between two variables	2	CO1
	(vii) Which of the following is true about a perfect positive correlation? A) The correlation coefficient is -1 B) The correlation coefficient is 1 C) There is no correlation coefficient D) The correlation coefficient is 0	2	CO1
	(viii) The mean of a discrete random variable is calculated as: A) The sum of all possible values divided by the number of values B) The midpoint of the range of values C) The most frequently occurring value D) The difference between the highest and lowest values	2	CO1
	(ix) Which of the following is a characteristic of a good index number? A) Sensitivity to outliers B) Stability over time C) Complexity in calculation D) High variability	2	CO1
	(x) In a binomial distribution: A) Each trial has two possible outcomes B) Each trial has multiple possible outcomes C) The probability of success remains constant from trial to trial D) The probability of success varies from trial to trial	2	CO1
	SECTION B **4Qx5M= 20 Marks**		
2.	**Write short note of the Following**		
	(a) Differentiate between discrete and continuous random variables.	4Qx5M	CO2

	(b) define addition law of expectation. (c) How is a scatter diagram useful in data analysis? (d) Discuss any one non probability sampling method.		
	SECTION-C **(3Qx10M=30 Marks)**		
	Attempt all questions		
3.	If a fair six-sided die is rolled. Prepare the probability distribution of getting each outcome and find out the expected value of its outcomes.	10	CO3
4.	Calculate the rank correlation co-efficient between 'X' and 'Y' variables. X: 10, 20, 35, 14, 18, 21, 16 Y: 15, 25, 18, 19, 20, 26, 27	10	CO3
5.	Write an equation that "best fits" the data in the table shown below. X: 0, 5, 10, 15, 20 Y: 7, 11, 16, 20, 26	10	CO3
	SECTION-D **2Qx15M= 30 Marks**		
	Attempt all questions.		
6.	Mr. Mohan Mehta has a chain of restaurants in many cities of northern India and was interested in diversifying his business. His only son, Kamal, never wanted to be in the hospitality line. To settle Kamal into a line which would interest him, Mr. Mehta decided to venture into garment manufacturing. He gave this idea to his son, who liked it very much. Kamal had already done a course in fashion designing and wanted to do something different for the consumers of this industry. An idea struck him that he should design garments for people who are very bulky but want a lean look after wearing readymade garments. The first thing that came to his mind was to have an estimate of people who wore large sized shirts (42 size and above) and large sized trousers (38 size and above). A meeting was called of experts from the garment industry and a number of fashion designers to discuss how they should proceed. A common concern for many of them was to know the size of such a market. Another issue that	15	CO4

	was bothering them was how to approach the respondents. It was believed that asking people about the size of their shirt or trousers may put them off and there may not be any worthwhile response. A suggestion that came up was that they should employ some observers at entrances of various malls and their job would be to look at people who walked into the malls and see whether the concerned person was wearing a big sized shirt or trousers. This would be a better way of approaching the respondents. This procedure would help them to estimate in a very simple way the proportion of people who wore big-sized garments. (a) Name the sampling design that is being used in the study. (b) Can you suggest a better design?		
7.	From the following data, obtain $R_{1.23}$	15	CO4

X_1	65	72	54	68	55	59	78	58	57	51
X_2	56	58	48	61	50	51	55	48	52	42
X_3	9	11	8	13	10	8	11	10	11	7