Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019-Set-II

Course: Research Methodology and Advance Statistics **Semester: I**
Program: MA (EE) **Time: 03 Hours**
Course code: DSRM 7001 **Max. Marks: 100**
Instructions:

SECTION A

		Marks	CO
Q 1	**Select the most appropriate answer.**	**2 X 10=20**	**CO_1**
I.	What is the purpose of doing research? (a) To identify problem (b) To find the solution (c) Both a & b (d) None of these		
II.	Which distribution has mean and variance same? (a) Binomial Distribution (b) Poisson Distribution (c) Normal Distribution (d) None of these		
III.	A distribution has a mean of 40 and standard deviation of 5. The value of 68% of the distribution can be found between what two numbers? (a) 30 and 50 (b) 0 and 45 (c) 0 and 68 (d) 35 and 45		
IV.	Which one is correct in terms of probability of any event E (a) $0 \le P(E) \le 1$ (b) $0 < P(E) < 1$ (c) $-1 \le P(E) \le 1$ (d) None of these		
V.	The alternative hypothesis is "that more than 80% of the students know driving" is an example of		

	(a) One-tailed test (b) Two-tailed test (c) Type 1 error (d) Type 2 error		
VI.	The limits of Karl pear son's correlation coefficient (r) explains (a) Linear Relationship (b) Non-linear Relationship (c) Any kind of relationship between two variable (d) None of these		
VII.	A new assessment survey is to be distributed to faculty. A random sample of departments is selected and everyone in the department is included in the sample. This scenario is an example of which sampling design? (a) stratified sampling (b) multi-stage sampling (c) cluster sampling (d) systematic sampling		
VIII.	A Sampling frame is (a) A summary of the various stages involved in designing a survey (b) An outline view of all the main clusters of units in a sample (c) A list of all the units in the population from which a sample will be selected (d) None of these		
IX.	If a test was generally very easy except for a few students who had very low scores, then the distribution of scores would be (a) Positively skewed (b) Negatively skewed (c) Not skewed at all (d) None of these		
X.	Temperature is suitable example of (a) Nominal data (b) Ordinal data (c) Interval data (d) Ratio data		
SECTION B			

Q	**Attempt any four questions**	**5 X 4=20**	
2.	For the population of size 5 with unit numbers as 1, 2, 3, 4select all possible samples suing simple random sampling without replacement.		**CO_2**
3.	A company has 140 employees, of which 30 are supervisors. Eighty of the employees are married, and 20% of married employees are supervisors. If a company employee is randomly selected, what is the probability that the employee is married and supervisor?		**CO_3**
4.	**Indicate the type of scale (nominal , Ordinal, Interval & Ratio) that is being used in each of the following questions :** (a) State the order of your preference for the following colors: (i) Gray (ii) Green (iii) Black (iv) Blue (b) Was the Business Method Course was difficult to understand? : (i) Yes (ii) No		**CO_2**
5.	According to the Bureau of Labor Statistics the average annual salary of a worker in Detroit Michigan is $35,748. Suppose the median annual salary for a worker in this group is $31,369 and the mode is $29,500. Is this distribution of salaries for this group skewed ? If so, how and why ? Which of these measure of central tendency would you use to describe these data ? why ?		**CO_3**
6.	The consumption of Ice-cream is given in the following table, what can you conclude about the Ice cream consumption form the table below: **Gender** **Male** / **Female** **Low Income** / **High Income** / **Low Income** / **High Income** High Consumption: 30% / 38% / 20% / 60% Low Consumption: 70% / 62% / 80% / 40% Column Total: 100% / 100% / 100% / 100% No. of respondents: 400 / 180 / 200 / 220		**CO_4**
	SECTION-C		
Q	**Attempt any four questions :**	**10 X 4 =40**	

7.	What do you mean by correlation? Calculate Karl Pearson's correlation coefficient for the given data and comment on it. **X**: -3, -2, -1, 1, 2, 3 **Y**: 9, 4, 1, 1, 4, 9		**CO_2**
8.	Consider the following data sets which shows the grouped frequency distribution of 100 students in the subject Quantitative Methods in 2016. Marks: 0-10, 10-20, 20-30, 30-40, 40-50, 50-60 No. of students: 10, 12, 14, 12, 10, 6 Calculate any one measure of central tendency and standard deviation conclude about the nature of the data set.		**CO_3**
9.	Identify with brief reasoning each of the following sampling methods: (a) The population of interest is in the alphabetical order. Starting with 8^{th} name, every 9^{th} member thereafter was selected as a member of sample. The sample therefore, consisted of numbers 8, 17, 26, 35 and so-on. (b) A large precinct was subdivided into 25 smaller areas, then five of these areas were selected at random and residents in these five areas were interviewed.		**CO_4**
10.	Describe any two methods of secondary data collection along with their merits and demerits.		**CO_3**
11	Since I have joined this organization, many accidents have taken place and due to that we have lost many lives specially the young generation's life that is the future of this nation. I have also observed the different age group have different approaches towards following safety measure /precaution while riding bikes. Many a time accidents occur but the effect is not that huge since the precaution has been taken. So out of curiosity I wanted to test (using 5% level of significance) whether the accidents occur uniformly over week days or not on the basis of the following information: Days of the week: Sun Mon Tue Wed Thu Fri Sat No. of accidents: 11 13 14 13 15 14 18		**CO_4**

	Test the problem and give your conclusion.		
12	An analyst sought to predict the annual sales for a home-furnishing manufacturer using the following predictor variables: X_1 = Marriages during the year. X_2 = Housing starts during the year. X_3 = Annual disposable personal income. X_4 = Time trend (first year = 1, and so forth) Using data for 24 years, the analyst calculated the following estimating equation: $Y = 49.85 + 0.068X_1 + 0.036X_2 + 1.22X_3 – 19.54X_4$ The analyst also calculated an $R^2 = 0.92$ and a standard error of estimate of 11.9, Interpret the above equation and statistics.		**CO_5**
	SECTION-D		
Q	Answer the Question	**20**	
13.	What is in a Car? **2.** Sridhar from Bengaluru, had developed and electric car—***VERVE*** (It is a fully automatic, no clutch, no gears), two-door hatchback, easily seating two adults and two children with a small turning radius of just 3.5 meters. It runs on batteries and as compared and as compared to other vehicles, has an onboard charger to facilitate easy charging which can be carried out by plugging into any 15 amp. Socket at home or work place. A full battery charge takes less than seven hours and gives a range of 80 km. In a quick- charge mode (two and half hours) 80 per cent charge is attained which is good enough for 65 km. A full charge consumes just about 9 units of electricity. Somehow the product did not take off the way he expected. He is contemplating about repositioning the car. As he stood looking at the prototype, he knew that there were a couple of questions to which he must find answers before he undertook the repositioning exercise. Who should be the targeted segment –old people, young college going students, housewives or……? What should be the positioning stance? What kind of image would these customers relate to? Was a new name or punch line required? How should the promotions be undertaken? Hyundai had done it with Shah Rukh Khan, should he also consider a celebrity? If yes who? **Answer the following questions:** What kind of research study should undertake? (a) Define the objectives of his research		**CO_5**

	(b) Do the stated objectives have scope for a qualitative research? (c) Do the stated objectives have scope for a qualitative research?		

Appendix-1

Test	Level of Significance	Tailed	Degree of Freedom	Value
Z	5%	Two	-	1.96
Z	5%	One	-	1.64
Z	1%	Two	-	2.58
t	5%	two	5	2.571
t	5%	Two	6	2.447
t	5%	Two	7	2.365
χ^2	5%	-	3	7.815
χ^2	5%	-	5	11.071
χ^2	5%	-	6	12.592
χ^2	5%	-	7	14.067
χ^2	5%	-	8	15.507