

<b>Name:</b>	 <b>UPES</b> <small>UNIVERSITY WITH A PURPOSE</small>
<b>Enrolment No:</b>	

**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**  
**End Semester Examination, December 2021**

<b>Course: Quantitative Methods</b> <b>Program: MBA (BA/IB/DGB/O&amp;G)</b> <b>Course code: DSQT7001</b>	<b>Semester: 1</b> <b>Time: 03 Hours</b> <b>Max. Marks: 100</b>
--	---

**SECTION A ( 20 Marks)**

	Each question in section A is a multiple-choice question with four answer choices. Read each question and choose the one best answer.	Marks	CO
<b>1</b>	<b>The percent of total variation of the dependent variable Y explained by the set of independent variables X is measured by</b>  a) Coefficient of Correlation b) Coefficient of Skewness c) Coefficient of Determination d) Standard Error of Estimate	<b>2</b>	<b>CO1</b>
<b>2</b>	<b>A coefficient of correlation is computed to be -0.95 means that</b>  a) The relationship between two variables is weak b) The relationship between two variables is strong and positive c) The relationship between two variables is strong and but negative d) Correlation coefficient cannot have this value	<b>2</b>	<b>CO1</b>
<b>3</b>	<b>In a Poisson probability distribution</b>  a) The mean and variance of the distribution are the same (equal) b) The probability of success is always greater than 5 c) The number of trials is always less than 5 d) It always contains a contingency table	<b>2</b>	<b>CO1</b>
<b>4</b>	<b>If the occurrence of one event means that another cannot happen, then the events are</b>  a) Independent b) Mutually Exclusive c) Bayesian d) Empirical	<b>2</b>	<b>CO1</b>

5	<p><b>Coefficient of Correlation values lies between</b></p> <p>a) -1 and +1  b) 0 and 1  c) -1 and 0  d) None of these</p>	2	CO1
6	<p><b>If two variables oppose each other then the correlation will be</b></p> <p>a) Positive Correlation  b) Zero Correlation  c) Perfect Correlation  d) Negative Correlation</p>	2	CO1
7	<p><b>Normal Distribution is</b></p> <p>a) Mesokurtic  b) Leptokurtic  c) Platykurtic  d) None of these</p>	2	CO1
8	<p><b>Two regression lines are parallel to each other if their slope is</b></p> <p>a) Different  b) Same  c) Negative  d) None of these</p>	2	CO1
9	<p><b>If <math>X \sim B(5,0.8)</math> then probability of success is</b></p> <p>a) 0.5  b) 0.25  c) 0.8  d) 0.4</p>	2	CO1
10	<p><b>The mean of 25 observations is 36. The mean of first 13 observations is 32 and that of last 13 observations is 39. What is the value of 13<sup>th</sup> observation?</b></p> <p>a) 20  b) 23  c) 32  d) 40</p>	2	CO1

**SECTION B****( 20 Marks)**

This section has 4 Questions of 5 marks each.

These questions are short answer type.

All the questions are compulsory.

1	What are the properties of regression lines?	5	CO2
2	Write a short note on coefficient of determination.	5	CO2
3	Write a short note on:  (a) Inclusive and exclusive class interval (b) Histogram	5	CO2
4	Identify with the brief reasoning each of the following sampling methods.  (a) The population of interest is in the alphabetical order. Starting with the 8 <sup>th</sup> name, every 9 <sup>th</sup> member thereafter was selected as a member of the sample. The sample therefore consisted of number 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.  (c) Executives were subdivided into six groups-including banking executives, industrial executives, and insurance executives. Random samples were taken from each of these groups and the sample results were weighed accordingly to the number in the group relative to the total.	5	CO2

**SECTION-C****( 30 Marks)**

This section has 3 Questions of 10 marks each, out of which first 2 Questions are compulsory.

Questions 8 has internal choice to attempt any one.

1	A car hire firm has two cars which is hires out day to day. The number of demands for a car on each day is distributed as Poisson variate with mean 1.5. a) Calculate the proportion of days on which neither car is used. b) Find the proportion of days on which some demand is refused.	10	CO3														
2	A study has been proposed to investigate the relationship between the birthweight of male babies and their adult height. Using the following data, find the correlation between birth weight of male babies and their adult height. <table border="1" style="margin-left: 20px;"> <tr> <td>Birthweight (lb)</td> <td>6</td> <td>7</td> <td>6.5</td> <td>8</td> <td>8.2</td> <td>7</td> </tr> <tr> <td>Adult Height(cm)</td> <td>159</td> <td>180</td> <td>156</td> <td>161</td> <td>181</td> <td>160</td> </tr> </table>	Birthweight (lb)	6	7	6.5	8	8.2	7	Adult Height(cm)	159	180	156	161	181	160	10	CO3
Birthweight (lb)	6	7	6.5	8	8.2	7											
Adult Height(cm)	159	180	156	161	181	160											

<b>3</b>	<p>A person deposited ₹5000 in a savings bank account at the end of first year and every succeeding year, he deposited ₹100 more than the preceding years. What amount has he deposited at the end of 20<sup>th</sup> years?</p> <p style="text-align: center;"><b>OR</b></p> <p>City residents were surveyed recently to determine readership of newspapers available. 50% of the residents read the morning paper, 60% read the evening paper, and 20% read both newspapers. Find the probability that a resident selected reads either the morning or evening paper or both the papers.</p>	<b>10</b>	<b>CO3</b>
----------	--	-----------	------------

**SECTION-D**

**( 30 Marks)**

**This section has 2 Questions of 15 marks each, out of which Question 9 is compulsory and Question 10 has internal choice to attempt any one.**

<b>1</b>	<p>Suppose that you are interested in using past expenditure on research and development by a firm to predict current expenditures on R&amp;D. you got the following data by taking a random sample of firms, where X is the amount on R&amp;D(in lakhs of rupees) 5 years ago and Y is the amount spent on R &amp; D(in lakhs of rupees) in the current year:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>X</td> <td>30</td> <td>50</td> <td>20</td> <td>80</td> <td>10</td> <td>20</td> <td>20</td> </tr> <tr> <td>Y</td> <td>50</td> <td>80</td> <td>30</td> <td>110</td> <td>20</td> <td>40</td> <td>50</td> </tr> </table> <p>Find the regression equation of Y on X. If a firm is chosen randomly and X=10, use the regression to predict the value of Y and give interpretation.</p>	X	30	50	20	80	10	20	20	Y	50	80	30	110	20	40	50	<b>15</b>	<b>CO4</b>		
X	30	50	20	80	10	20	20														
Y	50	80	30	110	20	40	50														
<b>2</b>	<p>A random variable X has the following probability function</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>Value of X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>p(x)</td> <td>0</td> <td>k</td> <td>2k</td> <td>3k</td> <td>4k</td> <td>k<sup>2</sup></td> <td>2k<sup>2</sup></td> <td>7k<sup>2</sup>+k</td> </tr> </table> <p>i.Find k,  ii.Evaluate P(X&lt;6), and P(0&lt;X&lt;5)  iii.Determine the distribution function of X.  iv.Calculate expectation of X [E(X)] which is also called mean of random number.</p> <p style="text-align: center;"><b>OR</b></p> <p>Rates of return over the past 6 years for two mutual funds are shown below.  Fund A: 8, -6, 18, -5, 23, 20  Fund B: 12, -4, 6, 10, 25, 2</p> <p>Which one has a higher level of risk?</p>	Value of X	0	1	2	3	4	5	6	7	p(x)	0	k	2k	3k	4k	k <sup>2</sup>	2k <sup>2</sup>	7k <sup>2</sup> +k	<b>15</b>	<b>CO4</b>
Value of X	0	1	2	3	4	5	6	7													
p(x)	0	k	2k	3k	4k	k <sup>2</sup>	2k <sup>2</sup>	7k <sup>2</sup> +k													