Roll No. **SAP ID**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, July 2020
Open Book – Through Blackboard Learning Management System

Course: Business Mathematics **Semester: II**
Programme: **BBA LLB (Hons.), 2019, B.Com LLB (Hons.), 2019**

Time: 03 hrs. **Max. Marks: 100**

Instructions:
As this examination is non-proctored, the students are expected to demonstrate a very high degree of Academic Integrity and not copy contents from resources referred. Instructors would look for understanding of the concept by the students and any similarity found from resources online/ offline shall be penalized in terms of deduction of marks and <u>even cancellation of paper in requisite cases</u>. The online examination committee of the School would also look for similarity of two answer scripts and if answer scripts of two or more students are found similar, both the answer scripts shall be treated as copied and lead to cancellation of the paper. In view of the aforesaid points, the students are warned that they should desist from any unfair means and provide answers in their own words.

All Questions are Compulsory
Answer each question

S. No.		Marks	CO
1	I. Define a) Random Experiment b) Independent events II. Give statement of Bayes' Theorem III. A, B and C are three arbitrary events. Find expressions for the following events, in set theoretic notations: a. All of them occur b. At least two events occur IV. Define Type I and Type 2 error, while testing a hypothesis.	**4×5 =20**	**CO1**
2	I. Show that the probability that exactly one of the events A and B occurs is $P(A) + P(B) - 2P(AB)$ II. In a courier company, three office assistants are assigned to process incoming mail. The first assistant processes 40%, the second one 35% and the third one processes 25% of the mail. The first, second and third assistant has an error rate of 0.04, 0.06 and 0.03 respectively. A mail is selected at random and found to have an error. The manager of the company wishes	**2×10= 20**	**CO2**

<table>
<tr><td></td><td>to know the probability that the mail was processed by first, second or third assistant respectively.</td><td></td><td></td></tr>
<tr><td>3</td><td>An incomplete distribution is given below:

Marks : $0-10$ $10-20$ $20-30$ $30-40$ $40-50$ $50-60$

No. of students: 5 15 20 f_1 20 10

You are told that the mean value is 34 and the total frequency is 100. Find out the value of f_1. Also, calculate the value of the mode.

OR

The data on the profit (in Rs. Lakhs) earned by 60 companies are as follows:

Profits $0-10$ $10-20$ $20-30$ $30-40$ $40-50$ $50-60$

No. of Companies: 5 12 20 16 5 2

Calculate the coefficient of quartile deviation and the coefficient of average deviation w.r.to mean.</td><td>20</td><td>CO3</td></tr>
<tr><td>4</td><td>Calculate the coefficient of correlation and two regression lines for the following data:

Country | % of group smoking heavily | % of group with lung cancer
A | 10 | 5
B | 20 | 15
C | 20 | 20
D | 30 | 25
E | 30 | 20

Hence find the probable percentage of group with lung cancer in a country with 45% of group smoking heavily.</td><td>20</td><td>CO4</td></tr>
<tr><td>5</td><td>Below are given the figures of production (in million tons) of a sugar factory:

<table><tr><td>Year</td><td>2006</td><td>2007</td><td>2008</td><td>2009</td><td>2010</td><td>2011</td><td>2012</td></tr><tr><td>Production in(m. tons)</td><td>80</td><td>90</td><td>92</td><td>83</td><td>94</td><td>99</td><td>92</td></tr></table>
Fit a straight line trend by the ‘Least Square Method’ and tabulate the trend values.</td><td>20</td><td>CO4</td></tr>
</table>

I, ……., understand that submitting work that isn’t my own may result in failure in this paper and I may also be subject to Disciplinary Proceedings as per the Academic Integrity policy of the University.