Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May,2019

Course: Quantitative Techniques for Decision Making (CLNL1005) **Semester: II**

Programme: B.Sc., LL.B. (Hons.)

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

Instructions: Calculators allowed.

SECTION A

Q	All questions are compulsory and each carry equal marks	Marks	CO
1	Find the mode for the following ungrouped data 6, 5, 5, 7, 4, 8, 3, 4, 4.	2	CO1
2	Explain level of significance in short.	2	CO3
3	Define Independent and dependent events with example	2	CO2
4	Find the coefficient of rank for the data: 4 8 1 6 6 2 9 3 6 9.	2	CO1
5	Explain null and alternative hypothesis.	2	CO3

SECTION B

Q	All questions are compulsory and each carry equal marks	Marks	CO
6	In a Bolt factory, machines A,B and C manufacture respectively 25%, 35% and 40%. Of the total output 5,4 and 2 percent are defective bolts. A Bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machine B?	10	CO2
7	Before an increase in excise duty on tea, 800 people out of a sample of 1000 persons were found to be tea drinkers. After an increase in the duty, 800 persons were known to be tea drinkers in a sample of 1200 people. Do you think that there has been a significant decrease in the consumption of tea after the increase in the excise duty?	10	CO3

SECTION-C

Q	All questions are compulsory and each carry equal marks	Marks	CO
8	After investigation it has been found the demand for automobiles in a city depends mainly, if not entirely, upon the number of family residing in that city. Below are given figures of sales of automobiles in the five cities for the year 2003 and the number of families residing in those cities. Estimated sales for the year 2004, for city A, if number of family increased to 100, then the sales of automobiles.	10	CO1
9	A machine is producing bolts a certain fraction of which are defective. A random sample of 400 is taken from a large batch and is found to contain 30 defective bolts.	10	CO3

City	A	B	C	D	E
No. of families (in Lakh (X))	70	65	80	60	90
Sales of Automobiles (in 000's (Y))	25.2	28.6	30.2	22.3	35.4

	Does this indicate that the proportion of defectives is larger than that claimed by the manufacturer if the manufacturer claims that only 5% of his product are defective?		
	SECTION-D		
Q	**Attempt any five questions**	**Marks**	**CO**
10	Find the correlation coefficient between the sales and expenses from the following: **Firm** 1 2 3 4 5 6 7 8 9 10 Sales 50 50 55 60 65 65 65 60 60 50 Expenses 11 13 14 16 16 15 15 14 13 13	**10**	**CO1**
11	A die is thrown 276 times and the results of these throws are given below: *Number appeared on the die* 1 2 3 4 5 6 *Frequency* 40 32 29 59 57 59 Test whether the die is biased or not.	**10**	**CO3**
12	**Calculate the mean, median, mode, quartiles and interquartile range:** **Marks more than** 0 20 40 60 80 100 120 No. of students 80 76 50 28 18 9 3	**10**	**CO1**
13	The following table gives the number of accidents that took place in an industry during various days of the week. Test if accidents are uniformly distributed over the week. *Day* Mon Tue Wed Thu Fri Sat *Number of accidents* 14 18 12 11 15 14	**10**	**CO3**
14	A candidate is selected for interview of management trainees for 3 companies. For the first company there are 12 candidates, for the second company there are 15 candidates and for the third company there are 10 candidates. What are the chances of getting job in at least one of the company?	**10**	**CO4**
15	Commodity / 2007 (Price, Quantity) / 2008 (Price, Quantity) Gold 2 8 4 6 Silver 5 10 6 5 Copper 4 14 5 10 Alluminium 2 19 2 13 Construct index number of the price from the following data by applying • Laspeyres method, • Paasche method, • Dorbish & Bowley's method Fisher's ideal method.	**10**	**CO2**

Standard Values:

The tabulated value of Z at 5% level of significance for the right tailed test is 1.645

Tabulated value of Chi-square at 5% level of significance and on 5^{th}degree of freedom is 11.09

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SECTION A

Q	**All questions are compulsory and each carry equal marks.**	**Marks**	**CO**
1	If the arithmetic mean of data 40, 10, 70, 30, 50, X, 60 is 40. Find the value of X.	**2**	**CO1**
2	Define Q_1, Q_3 and Inter quartile range	**2**	**CO2**
3	Define Mutually Exclusive Events with example	**2**	**CO2**
4	Classify the types of sampling	**2**	**CO3**
5	Define the type of errors based on the hypothesis	**2**	**CO3**

SECTION B

Q	**All questions are compulsory and each carry equal marks.**	**Marks**	**CO**
6	A candidate is selected for interview of management trainees for 3 companies. For the first company there are 12 candidates, for the second company there are 15 candidates and for the third company there are 10 candidates. What are the chances of getting job in at least one of the company?	**10**	**CO2**
7	A machine is producing bolts a certain fraction of which are defective. A random sample of 400 is taken from a large batch and is found to contain 30 defective bolts. Does this indicate that the proportion of defectives is larger than that claimed by the manufacturer if the manufacturer claims that only 5% of his product are defective?	**10**	**CO3**

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No. of families (in Lakh (X))	70	65	80	60	90
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SECTION-D

Q	**Attempt any five questions**	**Marks**	**CO**
10	**Calculate the mean, median, mode, quartiles and interquartile range:** **Marks more than** 0 | 20 | 40 | 60 | 80 | 100 | 120 No. of students 80 | 76 | 50 | 28 | 18 | 9 | 3	**10**	**CO1**
11	The following table gives the number of accidents that took place in an industry during various days of the week. Test if accidents are uniformly distributed over the week. *Day* | *Mon* | *Tue* | *Wed* | *Thu* | *Fri* | *Sat* *Number of accidents* | *14* | *18* | *12* | *11* | *15* | *14*	**10**	**CO3**
12	Find the correlation coefficient between the sales and expenses from the following: **Firm** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** Sales 50 | 50 | 55 | 60 | 65 | 65 | 65 | 60 | 60 | 50 Expenses 11 | 13 | 14 | 16 | 16 | 15 | 15 | 14 | 13 | 13	**10**	**CO1**
13	A die is thrown 276 times and the results of these throws are given below: *Number appeared on the die* | *1* | *2* | *3* | *4* | *5* | *6* *Frequency* | *40* | *32* | *29* | *59* | *57* | *59* Test whether the die is biased or not.	**10**	**CO3**
14	Construct index number of the price from the following data by applying • Laspeyres method, • Paasche method, • Dorbish & Bowley's method • Fisher's ideal method. Commodity | 2007 (Price, Quantity) | 2008 (Price, Quantity) A 2 8 4 6 B 5 10 6 5 C 4 14 5 10 D 2 19 2 13	**10**	**CO4**
15	In a Bolt factory, machines A,B and C manufacture respectively 25%, 35% and 40%. Of the total output 5,4 and 2 percent are defective bolts. A Bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machine B?	**10**	**CO2**

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