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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MBA (Integrated)

SEM: II - THEORY EXAMINATION (20__ - 20__)

Subject: Introduction to Business Statistics

Time: 2.5 Hours

Max. Marks: 60

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

15

1. Attempt all parts:-

- 1-a. If each data in the observation is increased by 5, then the mean (CO1,K2) 1
- (a) Remains the same
- (b) Increased by 5
- (c) Decreased by 5
- (d) None of the above
- 1-b. The correlation for the values of two variables moving in the opposite direction is (CO2,K2) 1
- (a) Positive
- (b) Negative
- (c) Perfect
- (d) None of these
- 1-c. is the probability of getting a vowel in the English alphabet. (CO3,K3) 1
- (a) 1/26
- (b) 1/13
- (c) 5/26
- (d) None of these
- 1-d. Binomial distribution is adistribution. (CO4,K1) 1
- (a) Discrete
- (b) Continuous

- (c) Regular
- (d) Irregular

- 1-e. The purpose of hypothesis testing is to: (CO5,K2) 1
- (a) Test how far the mean of a sample is from zero
 - (b) Determine whether a statistical result is significant or not.
 - (c) Determine the appropriate value of the significance level
 - (d) Derive the standard error of the data

2. Attempt all parts:-

- 2.a. Calculate mean from the following data: (CO1,K2) 2

X	2	3	9	4	2
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- 2.b. State in each case whether there is Positive Correlation, Negative Correlation or No Correlation: (CO2,K2) 2

- a) No. of cows and milk produced
- b) Weight of a person and intelligence

- 2.c. A and B are two events such that $P(A) = 0.4$, $P(B) = 0.6$ and $P(A \cap B) = 0.2$. Then $P(A \cup B)$ is equal to _____ (CO3,K3) 2

- 2.d. Comment on the following statement whether it is true or false: (CO4,K2) 2
Mean of Binomial distribution is 3 and variance is 4.

- 2.e. Write down the main objectives of sampling. (CO5,K1) 2

SECTION-B

3. Answer any three of the following:-

- 3-a. Calculate the mode of the following distribution: (CO1,K3) 5

Age :	0-6	6-12	12-18	18-24	24-30	30-36	36-42
Frequency :	6	11	25	35	18	12	6

- 3-b. The two Regression equations are: $2y - x = 50$ and $3y - 2x = 10$. (CO2,K3) 5
Calculate (i) the mean values of x and y (ii) Karl Pearson coefficient of correlation between x and y.

- 3.c. A discrete random variable X has the following distribution: 5

X	1	2	3	4
P(X=x)	0.20	0.10	0.45	0.25

Calculate the Expectation of X and also the variance of X. (CO3,K3)

- 3.d. The experience shows that 4 accidents occur in a plant on an average per month. Calculate the probabilities of less than 3 accidents in a certain month. Use Poisson distribution. (Given $e^{-4} = 0.01832$). (CO4,K3) 5

- 3.e. A Sample of 400 male students is found to have a mean height of 160 cm. Can it be reasonably regarded as a sample from a large population with mean height 162.5 cm and SD 4.5 cm? . Given that the tabular value for two tailed test is 1.96 at 5% LOS. (CO5,K3) 5

SECTION-C

4. Answer any one of the following:-

- 4-a. From the following frequency distribution calculate the standard deviation: (CO1,K3) 6
- | | | | | | | | |
|-----|---|---|----|----|----|---|----|
| x | 5 | 4 | 9 | 12 | 15 | 6 | 10 |
| f | 8 | 6 | 12 | 8 | 6 | 9 | 10 |
- 4-b. Calculate the Median and Mode from the following data: (CO1,K3) 6
- | | | | | | | | | |
|-----------------|------|-------|-------|-------|-------|-------|-------|-------|
| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
| No. of students | 15 | 20 | 25 | 24 | 10 | 33 | 71 | 51 |
5. Answer any one of the following:-
- 5-a. Calculate the spearman's rank correlation coefficient from following data.(CO2,K3) 6
- | | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|----|----|
| x | 40 | 64 | 61 | 90 | 82 | 72 | 25 | 98 | 36 | 78 |
| y | 48 | 52 | 57 | 85 | 62 | 67 | 60 | 90 | 51 | 83 |
- 5-b. Calculate Karl Pearson's coefficient of correlation (r) for the following data: (CO2,K3) 6
- | | | | | | | |
|---|---|----|----|----|----|----|
| X | 1 | 3 | 5 | 7 | 8 | 10 |
| Y | 8 | 12 | 15 | 17 | 18 | 20 |
6. Answer any one of the following:-
- 6-a. Four cards are drawn from a pack of cards. Calculate the probability that 6
- All are diamonds
 - There are two spades and two hearts. (CO3,K3)
- 6-b. State multiplication law of Probability.(CO3,K2) 6
- Two dice are rolled, Calculate the probability that the sum of the number of both the dice is:
- Equal to 2
 - Equal to 5
7. Answer any one of the following:-
- 7-a. The probability of a bolt being faulty is 0.3. Calculate the probability that in a random sample of 20 bolts there are (a) exactly 2 faulty bolts, b) more than 3 faulty bolts. (CO4,K3) 6
- 7-b. Write down the probability mass function, mean, variance, standard deviation, and recurrence relation formula of Poisson Distribution. (CO4,K2) 6
8. Answer any one of the following:-
- 8-a. A toy manufacturer wants to get batteries for toys. A team collected 41 samples from supplier A and the variance was 110 hours. The team also collected 21 samples from supplier B with a variance of 65 hours. At a 0.05 alpha level determine if there is a difference in the variances (Tabulated $F(40, 20) = 2.287$) (CO5,K3) 6
- 8-b. A sample of 18 items has a mean 24 units and standard deviation 3 units. Test the hypothesis that it is a random sample from a normal population with mean 27 6

units ($t_{0.05,17} = 2.11$). (CO5,K3)

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