GALGOTIAS UNIVERSITY

ADMISSION NUMBER													

School of Computing Science and Engineering

Bachelor of Computer Applications
Semester End Examination - Jun 2024

Duration : 180 Minutes
Max Marks : 100

Sem II - E1UA202T / BCAS1204 Probability and Statistics

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Define range. Find the range & coefficient of range: K1 (3)

Marks	Students
0-10	12
10-20	18
20-30	27
30-40	20
40-50	17
50-60	6

2) Define discrete random variables and continuous random variables with examples. K2 (4)

3) Consider a random variable X with probability density function $f(x) = \begin{cases} 4x^3, & if\ 0 < x < 1 \\ 0, & otherwise \end{cases}$ Find E(X) and V(X). K2 (6)

4) If X is a binomial random variable with n = 6 and p = 0.13, find the following values, expressed to 4 decimal places. K3 (6)
a) P (X = 4)
b) P (X ≥ 4)
c) P (X < 4)

5) Calculate the probability for the random variable 5 using normal distribution with the population mean is 2 and standard deviation is 3. K3 (6)

6) The probability of X, Y, Z became managers are 4/9, 2/9, & 1/3 respectively. The probabilities that the bonus scheme will be introduced if X, Y, and Z becomes managers are 3/10, 1/2, & 4/5 respectively. K3 (9)
(a) What is the probability that bonus schemes will be introduced.
(b) If the bonus scheme has been introduced, what is the probability that the manager appointed was X?

7) X is a normally distributed variable with mean μ = 30 and standard deviation σ = 4. Find the probabilities K3 (9)
a) P (X < 40)
b) P (X > 21)
c) P (30 < X < 35)

8) A manufacturer produces light – bulbs that are packed into boxes of 100. If quality control studies indicate that 0.5% of the light-bulbs produced are defective, examine the percentage of the boxes will contain: K4 (8)
(a) no defective?
(b) 2 or more defectives?

9) Find the means of X and Y variables and the coefficient of correlation between them from the following two regression equations: K4 (12)
4X–5Y+33 = 0,
20X–9Y–107 = 0

10) (a) Find the t-test value for the following two sets of values: 7, 2, 9, 8 and 1, 2, 3, 4? K5 (10)
(b) A sample of 10 boxes of chips is drawn in which the mean weight is 490 gm and the standard deviation of the weight is 9 gm. Can the sample be considered to have come from population having mean weight 500 gm.

11) Find the standard deviation of the following data 7, 4, 8, 10, 11. Add 3 to all the values then find the standard deviation for the new values. K5 (15)

OR

Construct the simple linear regression equation of Y on X if K5 (15)

$$n = 7, \sum_{i=1}^{n} x_i = 113, \sum_{i=1}^{n} y_i = 182, \sum_{i=1}^{n} x_i^2 = 1983, \sum_{i=1}^{n} x_i y_i = 3186$$

12) For the random variable *X* with the given probability mass function as below, find the mean and variance. K6 (12)

$$f(x) = \begin{cases} 2(x-1) & 1 < x \leq 2 \\ 0 & otherwise \end{cases}$$

OR

The mean lifetime of 200 fluorescent light bulbs produced by a company is computed to be 3140 hours with a standard deviation of 240 hours. Check if there is any difference between population and sample mean using a 5% level of significance. K6 (12)