Duration: 2 $^{1/2}$Hrs   Marks: - 75

Note:-

1) All Questions are compulsory

2) Figures to the right indicate maximum marks.

Q1) Answer the following (Any 4 out of 6)   (20 M)

a) Define continues Random variable with example. (Co1) (R)

b) Enlist the properties of C.D.F of Discrete Random Variable. (Co1) (R)

c) Consider a game of tossing a coin 3 times simultaneously. Let X be the number of heads. There are 9 Possibl

    outcome $\Omega = \{$ TTT, TTH, THT, HTT, THH, HTH, HHT, HHH$\}$

         Where H indicates Head. T indicate Tail. Find the Mathematical Expectation of X. (C 01) (A)

d) Explain Mean and Variance of continues Random Variable (Co1) (U)

e) One Card is drawn at random form pack of 52 cards. What is the probability that it is a king or queen? (Co1)

    (A)

f) Find the possible value of x in case of tossing of coin simultaneously where x is the no. of head.(Co1)

Q2) Answer the following (Any 4 out of 6)   (20 M)

a) State and Explain the properties of Binomial distribution. (Co2) (U)

b) Six dice are thrown 720 times. How many times do you expect at least 3 dice to show a 4 or 6. (Co2) (U)

c) Find the constant 'C' such that the following functions are pdfs

       $F(x) = c/x^5$ for $0 \leq x \leq 2$

          $= 0$ otherwise   Co2 (A)

d) A random variable X has the distribution

X	0	1	4	6
f(x)	¼	3/16	5/16	¼

    Find the expected value, variance, and standard deviation of x (C02) (A)

e) Define f-distribution . Write main characteristic of distribution. (Co2) (R)

f) Explain the concept of Hypothesis Testing. (Co2) (U)

Q3) Answer the following (Any 4 out of 6)   (20 M)

a) The manufacturing of rubber chemicals by a batch process, has a normal yield of 690 lbs per batch. A new process is tired excrementally on 12th batches with the following yields:

      a. 620, 590, 660, 620, 700, 710, 690, 720, and 650 lbs is the yield of the new process a significantly different from that of old process? (Level of significance is 0.01) Co3 (A)

b) Explain the procedure to conduct 'F' test. (Co3) (U)

c) Write a short notes on " Confidence interval'. (Co3) (R)

d) What are the situations when one need to use non parametric test? (Co2) (R)

e) Motivated by initiatives of Government of India. A college in remote area started skill based education to its graduate courses students in addition to regular teaching, following data show grading (1 to 10) of students in regular degree course and skill based degree course . Co3 (A)

Regular degree program	8	7	6	2	5	8	7	3
Skill based Education	9	9	7	8	10	9	6	

Is there statistical evidence of a difference in scores in students receiving the additional skill based education and regular degree education. (Note Run the test using five step approach)

f) Explain procedure/ Steps in Kruskal-Wallis test. (Co3) (U)

(15M)

Q4) Answer the following (Any 5 out of 6)

a) Compare parametric and Non Parametric Test. Co4 (R)
b) What is Test statistic, Explain critical Region in testing of hypothesis. (Co4) (R)
c) Compare continuous and discrete random variable(Co3) (R)
d) List the properties of variance of Discrete Random Variable. (Co3) (R)
e) Explain Reliability function w.r.to Randomvariable . (Co1) (R)
f) State with Expression Binomial Distribution(CO1) (R)

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