First Year B.Sc. (Computer Science)
STATISTICS
CSST - 122 : Continuous Probability Distributions and Testing of Hypothesis
(2019 Pattern) (Semester - II) (Paper- II)

Time : 2 Hours]

[Max. Marks : 35

Instructions to the candidates:

1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable scientific calculator is allowed.
4) Use of statistical tables is allowed.
5) Symbols have their usual meaning unless otherwise stated.

Q1) Choose the most appropriate alternative for each of the following: [1 each]

a) If X and Y are independent normal variates such that $X \to N(5,9)$ and $Y \to N(4,25)$ then the distribution of X+Y is....

i) N (1. 16)   ii) N (9. 16)

iii) N (9. 34)   iv) N (1. 16)

b) A random variable X has an exponential distribution with mean 9. Then variance of X is...

i) 3   ii) 81

iii) 0   iv) 0.9

c) A random variable X has Pareto distribution with $\alpha = 3$, then mean of X is ...

i) 3   ii) 9

iii) 1.5   iv) 0.75

d) The probability of rejecting H_0 when it is true is called as

i) type I error   ii) Type II error

iii) level of significance   iv) standard error

e) The Chi-square test for goodness of fit is...

i) Two tailed test   ii) Left tailed test

iii) Right tailed test   iv) both right and left tailed test.

P.T.O.

Q2) Attempt any TWO of the following: [5 each]

a) Define probability mass function of U[a, b] distribution. State its mean and variance. Give an application of uniform distribution.

b) Suppose life time of a certain make of T.V. tube is exponentially distributed with a mean life 1600 hours. What is the probability that
   i) The tube will work upto 2400 hours?
   ii) The tube will survive after 1200 hours?

c) Explain the following terms:
   i) Population, ii) Sample, iii) Critical region, iv) Level of significance.

Q3) Attempt any TWO of the following: [5 each]

a) Describe procedure of drawing a sample of size n from $N(\mu, \sigma^2)$ using Box-Muller transformation.

b) Define procedure of paired t-test.

c) In a sample of 7 observations, the sum of squared deviations from the mean is 94.5. In another sample of 10 observations, the sum of squared deviations from the mean is 101.7. Test whether the two variances are significantly different at 10% level of significance.

Q4) Attempt any ONE of the following.

a) i) Let X follows Normal distribution with mean 2 and variance 16. If $Y = 3X+2$ find i) $P(Y > 8)$ and ii) $P(^\wedge < Y < 9)$. [5]

   ii) The table below gives the number of books issued from a certain library on various days of a week. [5]

Days	Mon	Tue	Wed	Thurs	Fri	Sat
No. of books issued	120	130	110	115	135	110

   Test at 5% level of significance whether the issuing of books is independent of the day of the week.

P.T.O.

b)   i)   Explain the term hypothesis. Describe the large sample test for
          testing $H_0: \mu_1 = \mu_2$ against $H_1: \mu_1 \neq \mu_2$ [5]

     ii) A sample of 400 male students is found to have mean weight of
          50.47Kg. Can it be regarded as a sample from a large population with
          mean weight 52 Kg given that population standard deviation is
          1.2Kg?   [5]

✬   ✬   ✬