F.Y.B.Sc. Computer Science
Semester –II Examination
USCSST-122: CONTINUOUS PROBABILITY DISTRIBUTIONS AND TESTING OF HYPOTHESIS

Time: 2:00 Hours] **[Marks: 35**

Instructions to candidates:

1. All questions are compulsory.
2. Figure to the right indicate full marks
3. Use of calculator and statistical tables is allowed.
4. Symbols and abbreviations have their usual meaning

***Q1)* Choose the most appropriate alternative for each of the following:** **[5]**

a) 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

b) d) The probability of rejecting H0 when it is true is called as
i) Type I error ii) Type II error
iii) level of significance iv) standard error

c) In a test of hypothesis problem, the sample size is 57, then this test is called as
i)small sample test ii) small population test
iii) large sample test iv) large population test

d) A 4 × 3 contingency table was obtained. To test H0 : Two attributes A and B are independent then under H0 , the distribution of test statistic used in the test is
i)$\chi 2$ with 6 d.f ii) $\chi 2$ with 12 d.f
iii) $\chi 2$ with 7 d.f iv) $\chi 2$ with 11 d.f

e) Distribution free tests are called as:
i)Parametric tests ii) Non parametric tests
iii) Z-Tests iv) t-tests

Q2) Attempt any TWO of the followings. **[10]**

a) Define each of the following.
i)Parameter
ii)Statistic
iii)Null hypothesis
iv)Critical Region
v)Type II error

b) Describe test procedure for testing mean of a population when sample size is large (n>30).

c) Let X follows normal distribution with mean 2 and variance 16.
If Y= (3X + 2), find P(6<Y<9).

Q3) Attempt any TWO of the following. **[10]**

a) Define exponential distribution with mean = Θ. State and prove lack of memory property of exponential distribution.

b) Define Run. Describe run test procedure for testing the randomness of a sample.

c) A certain factory runs in two shifts. A sample of 100 articles selected from production of day shift gave 52 defective articles whereas a sample of 700 articles selected from production of night shift gave 45 defective articles. Can we conclude that proportion of defective articles in the day shift is significantly less than that of night shift at 5% level significance?

Q.4) Attempt any ONE of the following. **[10]**

a) i) If a random variable $X \sim U(-2, 4)$ find mean and variance and distribution function of X. Obtain $P(-1 < X < 1)$

ii) Describe the paired t test.

b) i) Define:

Central Limit Theorem

Normal Approximation to Poisson Distribution

ii) In a radio listener's survey, 120 persons were interviewed and their opinions about preference to classical or light music depends on language were asked. The results are as follows:

	English	Hindi
Classical Music	13	45
Light Music	39	23

Examine at 5% level of significance, whether the preference to type of music is independent of language.

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