**Regulations:**

**A18**



**H.T No**

**Sreenidhi Institute of Science and Technology**

(An Autonomous Institution)

**Code No: 7HC09 Date: 21-Jan-2020 (FN)**

**B.Tech I-Year II-Semester External Examination, Jan/Feb-2020 (Supplementary)**

**PROBABILITY AND STATICS (CSE, IT and ECM)**

**Time: 3 Hours Max.Marks:70**

***Note: a****) No additional answer sheets will be provided.*

*b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.*

*c) Missing data can be assumed suitably.*

**Part - A Max.Marks:20**

**Answer all QUESTIONS.**

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| 1. | A fair die is tossed twice. Find the probability of getting a 1, 3 or 5 on the first toss and 2, 4 or 6 on the second toss. | [2M] |
| 2. | A sample of 400 items is taken from a population whose standard deviation is 10.The mean of the sample is 40. Calculate 95% confidence interval for the population mean. | [2M] |
| 3. | Define Type I and Type II errors. | [2M] |
| 4. | When do you apply F-test and what is the F-statistic? | [2M] |
| 5. | What is the difference between Skewness and Kurtosis? | [2M] |
| 6. | Write a multiple regression equation Y on X1 and X2 and normal equations. | [2M] |
| 7. | For the following discrete probability distribution, find k   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | X | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | P(X) | 0 | 2K | 2K | 3K |  | 2 | +K | | [2M] |
| 8. | A random sample of 500 apples was taken from a large consignment and 60 were found to be bad. Obtain the 98% confidence limits for the percentage number of bad apples in the consignment. | [2M] |
| 9. | Write the properties of Regression lines. | [2M] |
| 10. | What are the conditions of validity of chi square test | [2M] |

**Part – B Max.Marks:50**

**ANSWER ANY FIVE QUESTIONS. EACH QUESTION CARRIES 10 MARKS.**

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| 11. | a) | 2% of the items of a factory are defective .the items are packed in boxes .What is the probability that there will be   1. 2 defective items 2. At least 3 defective items in a box of 100 items? | [5M] |
|  | b) | If X is a normal variate with mean 30 and standard deviation 5.Find the probabilities that (i) 26 ≤ X ≤ 40 (ii) X ≥ 45. | [5M] |
|  |  |  |  |
| 12. |  | A population consists of five numbers 2,3,6,8 and 11. Consider all possible samples of size two which can be drawn with replacement from this population. Find   1. The mean of the population. 2. The standard deviation of the population. 3. The mean of the sampling distribution of means. 4. The standard deviation of sampling distribution of means. | [10M] |
|  |  |  |  |
| 13. | a) | Discuss the procedure to test a Hypothesis. | [5M] |
|  | b) | A machine puts out 16 imperfect articles in a sample of 500. After a machine is overhauled it puts out 3 imperfect articles in a batch of 100. Has the machine improved? | [5M] |
|  |  |  |  |
| 14. | a) | Under the quality improvement programme some teachers are trained by instruction methodology A and some by methodology B . In a random sample of size 10, taken from a large group of teachers exposed to each of these two method , the following marks are obtained in an appropriate achievement test.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Method-A | 65 | 69 | 73 | 71 | 75 | 66 | 71 | 68 | 68 | 74 | | Method-B | 78 | 69 | 72 | 77 | 84 | 70 | 73 | 77 | 75 | 65 |   Assuming that populations sample are normally distributed having equal variances, test the claim that Method B is more effective at 0.05 level of significance. | [5M] |
|  | b) | Explain the procedure of Chi-square test for independence of attributes. | [5M] |
|  |  |  |  |
| 15. | a) | What are the measures of central tendency and write their merits and demerits. | [5M] |
|  | b) | The variables X and Y are connected by the equation aX+bY+c=0. Show that the correlation between them is -1 if the sign of ’a’ and ‘ b’ is alike and +1 if they are different. | [5M] |
|  |  |  |  |
| 16. | a) | Discuss the Least square method to fit a Power curve. | [5M] |
|  | b) | The regression lines of two variables x and y are 3x+2y=26 and 6x+y=31. Find the means of x and y and also coefficient of correlation connecting x and y. | [5M] |
|  |  |  |  |
| 17. | a) | Probability density function of a random variable X is  f(X) =(1/2) SinX, for 0 ≤ X ≤  =0,else where  Find the Mode . | [6M] |
|  | c) | Explain One Tailed and Two Tailed Tests. | [4M] |
|  |  |  |  |
| 18. | a) | Discuss the t-test for two means. | [5M] |
|  | b) | Write a short note on Rank correlation. | [5M] |

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