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**SAINTGITS COLLEGE OF APPLIED SCIENCES**

**INTERNAL ASSESSMENT EXAMINATION, SEPTEMBER 2019**

**Department of Mathematics, Semester 3**

**Advanced Statistical Methods**

Total : **80 marks** Time: **3Hours**

**Section A**

*Answer any 10 questions. Each question carries 2 marks.*

1. What is the relation between mean and variance of Bernoulli distribution?

2. Give the properties of Binomial distribution

3. Explain Poisson distribution as limiting case of Binomial distribution

4. Define Uniform distribution

5. Explain chi-square distribution with its properties

6. Give the relation between chi-square and t-distributions

7. What is statistical inference and what are its branches?

8. What is standard error? Give 2 of its uses

9. What is the standard error of proportion for p = 0.1 and n = 100?

10. What are the uses of chi-square test?

11. What are the properties of a good estimator?

12. Write a 90% confidence limits for population mean for a given sample of size 16 with mean 53 and SD

 150 **(10x2=20)**

 **Section B**

Answer any six of the following. Each question carries 5 marks.

13. Four coins are tossed simultaneously. What is the probability of getting 3 heads?

14. Fit a Poisson distribution to the following data

 x : 0 1 2 3 4

 f : 123 59 14 3 1

15. Give the conditions under which Z-test is applied

16. A sample of 900 items is taken from a population with SD 15. The mean of the sample is 25. Test

 whether the sample has come from a population with mean 26.8

17. Of 500 people selected at random from a town 275 are drinkers of tea and others are drinkers of

 coffee. On the basis of these findings can you conclude that the tea and coffee are equally popular in the

 town

18. Explain the procedure for testing equality of 2 population proportions

19. A random sample of 200 villages was taken from district A and average population per village was 485

 with SD 50. Another random sample of 250 villages from the same district gave an average population

 of 510 per village with SD 40. Is the difference between the averages of 2 samples significant?

20. Explain the method of maximum likelihood estimation

21. A sample of 25 workers has an average wage of Rs 45 with SD 10. Give 90% confidence interval for

 mean wage of population from which the sample is taken

 **(6x5=30)**

**Section C.**

Answer any two of the following.

Each question carries 15 marks

22. Explain area property of Normal distribution. What is Standard Normal distribution? What is Standard

 Normal table?

23. From the following table test whether the colour of the son’s eye is associated with that of father

 Son’s eye colour

 Light Not light

 Light 471 151

 Not light 414 230

24. Obtain the sampling distribution of mean and variance of normal population

25. Explain about statistical estimation. What are the different types of estimation?

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