Register No.: ………………………………   Name: …………………………………………………………………..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER INTEGRATED M.C.A DEGREE EXAMINATION (S), SEPT 2022

(2020 SCHEME)

Course Code: **20IMCAT204**

Course Name: **Statistical Applications**

Max. Marks: **60**   **Duration: 3 Hours**

Statistical Table and non-programmable calculators up to Casio Fx991ESPlus may be permitted in the examination hall

PART A

(Answer all questions. Each question carries 3 marks)

1. Define negative correlation with examples.
2. Calculate correlation coefficient for the following data
   $n = 10, \sum x = 650, \sum y = 660, \sum(x - 65)^2 = 5398, \sum(y - 66)^2 = 2224, \sum(x - 65)(y - 66) = 2704$
3. Write any three properties of regression coefficients.
4. Given $\bar{X} = 90, \bar{Y} = 70, n = 10, \sum x^2 = 6360, \sum y^2 = 2860, \sum xy = 3900$, where x and y are deviations from respective means. Find the regression equation of Y on X.
5. Differentiate between Survey and censes.
6. A random sample of 100 items from a normal distribution has the sample mean 7.4 kg and a variance 1.44kg. Find a 95% confidence limits for the population mean.
7. Define the terms: (i) Significance level (ii) Types of statistical errors and (iii) Power of test.
8. Formulate the hypothesis to test whether the claim that *majority of the men in the KR residence association are smokers*, if 325 out of 600 men are found to be smokers in a survey. Also write the test statistics for the proposed test.
9. What are the assumptions for Student's t-test?
10. In an experiment on the immunization of humans from Covid 19, the following results were obtained. Find the expected frequency from this cross table.

Status	Died	Survived
Vaccinated	2	10
Not Vaccinated	6	6

PART B
(Answer one full question from each module, each question carries 6 marks)

MODULE I

11. The production manager of a company maintains that the flow time in days (y), depends on the number of operations (x) to be performed. The following data give the necessary information: (6)

x	2	2	3	4	4	5	6	6	7	7
y	8	13	14	11	20	10	22	26	22	25

Calculate the value of the Karl Pearson's Correlation Coefficient.

OR

12. Calculate Spearman's rank correlation coefficient between advertisement cost and sales from the following data   (6)

Advertisement Cost ('000 Rs)	39	65	62	90	82	75	25	98	36	78
Sales (Lakhs Rs.)	47	53	58	86	62	68	60	91	51	84

MODULE II

13. From the data given below, find the two regression equations   (6)

Marks in Economics	25	28	35	32	31	36	29	38	34	32
Marks in Statistics	43	46	49	41	36	32	31	30	33	39

OR

14. By using the following data, find out the two line of regression and from them compute the Karl Pearson's coefficient of correlation   (6)
$$\sum X = 250, \sum Y = 300, \sum XY = 7900, \sum X^2 = 6500, \sum Y^2 = 10000, N = 10$$

MODULE III

15. Find the maximum likelihood estimate for mean of normal distribution   (6)

OR

16. Explain the merits and demerits of Stratified Random sampling in Statistical Data collection.   (6)

MODULE IV

17. A die was thrown 9000 times and of these 3220 yielded a 3 or 4. Can the die be regarded as unbiased?   (6)

OR

18. Novartis Pvt.Ltd has the head office in Kolkata and a branch at Mumbai. The personal director wanted to know if the workers at the two places would like the introduction of work at home plan and a survey was conducted for this purpose. Out of a sample of   (6)

500 workers at Kolkata, 62% favours the new plan. At Mumbai, out of a sample of 400 workers, 41% were against the new plan. Is there any significant difference between the two groups in their attitude towards the new plan at 5% level?

MODULE V

19. A soap manufacturing company was distributing a particular brand of soap through a large number of retail shops. Before a heavy advertisement campaign, the mean sales per week per shop was 140 dozen. After the campaign, a sample of 26 shops was taken   (6) and the mean sales was found to be 147 dozen with standard deviation 16. Can you consider the advertisement effective?

OR

20. In a sample of 8 observations the sum of the squared deviations of items from their mean was 94.5. In another sample of 10 observations, the value was found to be 101.7. Test whether the difference is significance at 5% level.

(6)

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