

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER INTEGRATED MCA DEGREE EXAMINATION (S), AUGUST 2023 (2020 SCHEME)

Course Code: 20IMCAT204

Course Name: Statistical Applications

Max. Marks: 60

Duration: 3 Hours

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

PART A

(Answer all questions. Each question carries 3 marks)

1. Describe properties of Karl Pearson's Correlation coefficient.
2. Differentiate between Linear and Non-linear Correlation.
3. Differentiate between Correlation Analysis and Regression Analysis.
4. Define the terms (i) Regression line of X on Y (ii) Regression line of Y on X
5. Differentiate between Population and Sample.
6. What are the desirable properties of a good estimator?
7. Differentiate between Type I and Type II errors.
8. Differentiate between Null and Alternative hypothesis.
9. What are the assumptions of F test?
10. Mention the applications of Chi-square test.

PART B

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

MODULE I

11. Calculate Karl Pearson's coefficient of correlation from the following data.

X	3	4	5	6	7
Y	5	6	7	8	9

(6)

OR

12. Obtain the rank correlation coefficient for the following data:

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

(6)

MODULE II

13. The following table gives the quantity of a raw material purchased by Reliance Ltd at the specified prices during the 12 months of 1996.

(6)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Price/Kg	96	110	100	90	86	92	112	112	108	116	86	92
Quantity	250	200	250	280	300	300	220	220	200	210	300	250

- (i) Fit the two regression equations based on the data.
- (ii) Estimate the demand of the commodity when the price is Rs.70.
- (iii) Estimate the price when demand is 350kg.

OR

14. You are given the following data about advertising and sales.

	Advertising (Rs. in Lakhs)	Sales (Rs. in Lakhs)
Mean	10	90
S.D	3	12

(6)

The correlation coefficient is 0.8

- (i) Calculate the two regression lines.
- (ii) Find the likely sales when advertising expenditure is Rs.15 lakhs.
- (iii) What should be the advertising expenditure if the company wants to attain a sales target of Rs.120 lakhs?

MODULE III

15. Describe the desirable properties of a good estimator. (6)

OR

16. Find out the Maximum Likelihood estimate of variance of a Normal population. (6)

MODULE IV

17. In a random sample of 400 persons from a large population, 120 are females. Can it be said that males and females are in the ratio 5:3 in the population. Use 1% level of significance (6)

OR

18. A random sample of boots worn by 36 soldiers in a desert region showed an average life of 1.08 years with a S.D of 0.6 years. Under the standard conditions, the boots are known to have an average life of 1.28 years. Is there a reason, to conclude at 1% level of significance that uses in desert causes the mean life of such boots to decrease? Assume that the life of boots is normally distributed. (6)

MODULE V

19. In a survey of 200 boys of which 75 were intelligent, 40 had skilled fathers, while 85 of the unintelligent boys had unskilled fathers. Do these figures support the hypothesis that skilled fathers have intelligent boys? (6)

OR

20. A machine is designed to produce insulating washers for electrical devices of average thickness of 0.025 cm. A random sample of 10 washers was found to have an average thickness of 0.024 cm with a S.D of 0.002 cm. Test the significance of the deviation. (6)
