

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI - 600 086
(For candidates admitted from the academic year 2019-2020 & thereafter)

B. C. A. DEGREE EXAMINATION, APRIL 2024
FOURTH SEMESTER

COURSE : ALLIED CORE
PAPER : MATHEMATICS FOR COMPUTER SCIENCE-II
SUBJECT CODE : 19MT/AC/MS45
TIME : 3 HOURS **MAX. MARKS : 100**

SECTION – A

ANSWER ANY TEN QUESTIONS: (10×2=20)

1. Give the distribution function of binomial distribution.
2. Write the distribution function of Normal distribution.
3. What is Standard Normal curve?
4. Define Standard error.
5. Define Null Hypothesis.
6. Write down mean and variance of χ^2 -distribution.
7. Write any two advantages of non- parametric tests.
8. State the assumptions of F- test.
9. Define ANOVA.
10. What is positive correlation.
11. Give any two uses of correlation.
12. What is Regression?

SECTION – B

ANSWER ANY FIVE QUESTIONS: (5×8=40)

13. A normal curve has $\bar{X} = 20$ and $\sigma = 10$. Find the area between $X_1 = 15$ and $X_2 = 40$.
14. Write the properties of binomial distribution.
15. A college conducts both night and day classes intended to be equally effective.
A sample of 100-day students yields examination results as under:
 $\bar{X} = 72.4, \sigma_x = 14.8$.
A sample of 200-night students yields examination results as under:
 $\bar{X} = 73.9, \sigma_x = 17.9$
Are the two means statistically equal at 10% level?
16. Write down the steps to be followed in testing of hypothesis and give short explanation.
17. Write the limitations on the use of χ^2 - test.

18. Two samples are drawn from two normal population. From the following data test whether the two samples have the same variance at 5% level.

Sample 1	60	66	71	74	76	82	85	87		
Sample 2	61	66	67	85	78	63	85	86	88	91

19. Calculate the coefficient of correlation by Karl Pearson's Method from the following data relating to overhead expenses and cost of production.

Overhead expenses in Rs. (lakhs)	8	9	10	11	12	13	14	15	16
Cost of production in Rs. (lakhs)	15	15	16	19	17	18	16	18	19

SECTION – C

ANSWER ANY TWO QUESTIONS:

(2×20=40)

20. a) The number of defects per unit in a sample of 330 units of manufactured product was found as follows:

No. of defects	0	1	2	3	4
No. of units	214	92	20	3	1

Fit a Poisson distribution to the data.

- b) The heights of six randomly chosen soldiers are in inches:

76	70	68	69	69	68
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Those of 6 randomly chosen sailors are:

68	64	65	69	72	64
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Discuss in the light that these data throw on the suggestion that soldiers are, on the average, taller than sailors. Use t- test.

21. a) To test the efficiency of a new drug a controlled experiment was conducted where in 300 patients were administered the new drug and 200 other patients were not given the drug. The patients were monitored and the results were obtained as follows:

	Cured	Condition worsened	No effect	Total
Given the drug	200	40	60	300
Not given the drug	120	30	50	200
Total	320	70	110	500

Use χ^2 - test for finding the effect of drug.

- b) Perform a two- way ANOVA on the data given below:

Plant of land	Treatment			
	A	B	C	D
I	38	40	41	39
II	45	42	49	36
III	40	38	42	42

Use coding method subtracting 40 from the given numbers.

22. a) A machine produced 20 defective articles in a batch of 400. After overhauling, it produced 10 defectives in a batch of 300. Has the machine improved?

- b) From the following data obtain the two regression equations:

X	6	2	10	4	8
Y	9	11	5	8	7



