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(FOR THE CANDIDATES ADMITTED 25UAI2A1

DURING THE ACADEMIC YEAR 2025 ONLY) **REG.NO. :**

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS: MAY 2026

B.Sc(Computer Science with AI & ML) **MAXIMUM MARKS: 75**

SEMESTER : II **TIME : 3 HOURS**

PART - III

25UAI2A1 – PROBABILITY AND STATISTICS

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1	If P(A)=0.4, P(B)=0.5 and A, B are independent, then P(A∩B) is_____ a) 0.2 b)0.9 c)0.4 d)0
2	For a symmetric distribution_____ a) Mean > Median > Mode b) Mean = Median = Mode c) Mean < Median < Mode d) Mean ≠ Median
3	Test statistic for large sample mean is_____ a) t b) χ^2 c) F d) Z
4	F-test is used to compare a) means b) variances c) proportions d) frequencies
5	Degrees of freedom in χ^2 test is_____ a) n – 1 b) (r–1)(c–1) c) n – 2 d) r + c
	ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES
6	If P(A)=0.6 and P(B)=0.5, find P(A∩B) when A and B are independent.
7	Find the Median of: 4, 6, 8, 10, 12.
8	What is null hypothesis?
9	Why a 2 x 2 Latin Square is not possible?
10	Write any two applications of x^2 test.

(CONTD …. 2)

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SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

11	**a)**	From a pack of 52 cards, three cards are drawn at random. Find the probability that (i) all are kings (ii) at least one is an ace.
		(OR)
	b)	In a class, 60% students like Mathematics, 50% like Statistics and 30% like both. Find the probability that a student likes (i) Mathematics or Statistics (ii) only Mathematics.
12	**a)**	Find the range and standard deviation for 4, 6, 8, 10, 12
		(OR)
	b)	Find the Mean, Median and Mode of the following data 2, 4, 6, 8, 10
13	**a)**	A random sample of 100 items has a mean of 54. The population mean is 52 with standard deviation 10. Test whether the sample is drawn from the population at 5% level of significance.
		(OR)
	b)	A sample of 25 observations has mean 48 and standard deviation 6. Test whether the population mean is 50 at 5% level using t-test.
14	**a)**	A group of 10 rats fed on diet A and another group of 8 rats fed on diet B, recorded the following increase in weight(gms). Diet A : 5,6,8,1,12,4,3,9,6,10 Diet B : 2,3,6,8,10,1,2,8 Does it show superiority of diet A over diet B?
		(OR)
	b)	Perform one-way ANOVA for the following data: Group A | 8 | 10 | 12 Group B | 6 | 9 | 11 Group C | 7 | 10 | 13
15	**a)**	Apply χ^2 test to test the goodness of fit for the following data: **x** | 1 | 2 | 3 | 4 O | 18 | 22 | 20 | 40
		(OR)
	b)	If the two lines of regression are 8x -10y +66 = 0 and 40x - 18y - 214 =0.Find the Correlation Coefficient between X and Y.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

16	**a)**	Three machines A, B and C produce 25%, 35% and 40% of total items respectively. The defective percentages are 5%, 4% and 2%. An item is selected at random and found to be defective. Find the probability that it was produced by machine A using Bayes' theorem
		(OR)

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b) Four cards are drawn at random from well shuffled pack of cards. Find the probability that (i) all the four are queens, (ii) there is one card from each suit, (iii)two cards are diamonds and two are spades, (iv) all the four cards are hearts and one of them is jack

17 a) Find the mode of the following grouped data:
Class: 0–10, 10–20, 20–30, 30–40, 40–50
Frequency: 3, 7, 20, 12, 8

(OR)

b) Compute **Quartile Deviation** and **Coefficient of Quartile Deviation** from the following data
Class: [0–10, 10–20, 20–30, 30–40, 40–50
Frequency: 6, 10, 8, 4, 2]

18 a) Two large samples have the following statistics:Sample I: $n_1 = 100, \overline{x_1} = 64, \sigma_1 = 8$
Sample II: $n_2 = 120, \overline{x_2} = 61, \sigma_2 = 7$ .Test whether there is a significant difference between the two means at 5% level.

(OR)

b) A random sample of size 16 has mean 42 and standard deviation 4. Test whether the popula mean is 40 using t-test at 5% level.

19 a) Two horses A and B were tested according to the time(in seconds) to run a particular track with the following results:
Horse A 28 30 32 33 33 29 34
Horse B 29 30 30 24 27 29 Test whether the two variances are equal?

(OR)

b) The following table shows the yields obtained by three fertilizers when applied to four different fields. Apply Two-Way ANOVA and test the significance of fertilizers and fields at 5% level.

Fertilizer / Field	**F1**	**F2**	**F3**	**F4**
A	12	15	14	16
B	10	13	12	14
C	14	16	15	17

20 a) Two researchers A and B adopted different techniques while rating the student's level.

Researchers	Below Average	Average	Above Average	Genius	Total
A	40	33	25	2	100
B	8	60	44	10	200
Total	126	93	69	12	300

Calculate χ^2 and discuss whether we can say that the techniques adopted by them are significant?

(OR)

b) From the following data:

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

Find (i) the two regression equations (ii) the coefficient of correlation between the marks in mathematics and statistics (iii) the most likely marks in statistics, when marks in mathematics are 30.

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