23CMU314N/23CTU314N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Third Semester)

Common to Branches – **COMPUTER SCIENCE/ COMPUTER TECHNOLOGY**

STATISTICS & OPERATIONS RESEARCH

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Out of all Measures of dispersion, the easiest one to calculate is: (a) Standard deviation (b) range (c) variance (d) quartile deviation	K1	CO1
	2	Sum of squares of the deviations is minimum when deviations are taken from: (a) Mean (b) median (c) Mode (d) zero	K2	CO1
2	3	The term regression was introduced by (a) R.A. Fisher (b) Sir Francis Galton (c) Karl Pearson (d) None of the above	K1	CO2
	4	Regression coefficient is independent of: (a) origin (b) scale (c) both origin and scale (d) neither origin nor scale	K2	CO2
3	5	Large sample theory is applicable when (a) n>30 (b) n<30 (c) n<100 (d) n<1000	K1	CO3
	6	Student's 't' distribution was pioneered by (a) Karl Pearson (b) Laplace (c) R.A. Fisher (d) William S. Gosset	K2	CO3
4	7	In the case of one-way classification the total variation can be split into (a) Two components (b) Three Components (c) Four Components (d) Only one Components	K1	CO4
	8	In the case of one-way classification with N observations and t treatments, the error degrees of freedom is (a) N-1 (b) t-1 (c) N-t (d) Nt	K2	CO4
5	9	The initial solution of a T.P. obtained by _____ (a) North-West corner rule would invariably be optimum. (b) Least cost method does not provide the least cost solution to a T.P. (c) VAM would invariably be very near to optimum solution. (d) MODI method is infeasible.	K1	CO5
	10	The Penalty in VAM represents difference between the first _____ (a) Two largest costs (b) Largest and Smallest costs (c) Smallest two costs (d) None of these	K2	CO5

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SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Calculate the Arithmetic Mean from the following data *Age in Years*: 8, 10, 12, 15, 18 *Number of workers*: 5, 7, 12, 6, 10	K3	CO1
		(OR)		
	11.b.	Describe Limitation of statistics		
2	12.a.	Calculate the Rank correlation coefficient for the following data x: 92, 89, 87, 86, 86, 77, 71, 63, 53, 50 y: 86, 83, 91, 77, 68, 85, 52, 82, 37, 57	K4	CO2
		(OR)		
	12.b.	Difference between correlation and regression		
3	13.a.	State the properties of t-distribution	K4	CO3
		(OR)		
	13.b.	Explain the test procedure of paired – t-test		
4	14.a.	Explain the structure for two-way classification	K5	CO4
		(OR)		
	14.b.	Explain the test procedure for sign test		
5	15.a.	Find the initial basic feasible solution by the VAM A: 6, 3, 5, 4, 22 B: 5, 9, 2, 7, 15 C: 5, 7, 8, 6, 8 7, 12, 17, 9, 45 (P, Q, R, S, SUPPLY)	K4	CO3
		(OR)		
	15.b.	Enumerate the steps involved in solving a transportation problem using North West corner Rule		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Fine the Mean and Median for the following data Height in cm: 95-105, 105-115, 115-125, 125-135, 135-145 No of children: 19, 23, 36, 70, 52	K4	CO1
2	17	The following table gives age (X) in years of card and annual maintenance cot Y (in hundred rupees) X: 1, 3, 5, 7, 9 Y: 15, 18, 21, 23, 22 Estimate the maintenance cost for a 4 year old car after finding the regression equations	K5	CO2
3	18	Certain pesticide is packed into bags by a machine. A random sample of 10 bags is drawn and their contents are found to weigh (in kg) as follows: 50, 49, 52, 44, 45, 48, 46, 45, 49, 45 Test if the average packing can be taken to be 50 kg	K5	CO3
4	19	The following table gives the yields of 15 samples of plot under three varieties of seed. A: 20, 21, 23, 16, 20 B: 18, 20, 17, 15, 25 C: 25, 28, 22, 28, 32 Test using analysis of variance whether there is a significant difference in the average of seeds	K4	CO4
5	20	Draw a network and determine the critical path of the project,. Find all the floats. Activity: A, B, C, D, E, F, G Time: 4, 9, 3, 8, 7, 2, 5 Predecessors: None, None, A, B, B, D, E	K5	CO5

Z-Z-Z END