PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2023
(Third Semester)
Common to Branches – **COMPUTER SCIENCE & COMPUTER TECHNOLOGY**

STATISTICS & OPERATIONS RESEARCH

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 Determine the mode for the given data 11, 13, 17, 19, 13, 25, 23
(i) 25 (ii) 19
(iii) 13 (iv) 23

2 Which of the following techniques is an analysis of the relationship between two variables to help provide the prediction mechanism?
(i) Standard error (ii) Correlation
(iii) Regression (iv) Range

3 Null and alternative hypotheses are statements about:
(i) Population parameters
(ii) Sample parameters
(iii) Sample statistics
(iv) It depends - sometimes population parameters and sometimes sample statistics.

4 . The sign test assumes that the samples are
(i) Independent (ii) Dependent
(iii) Have the same mean (iv) have same s.d.

5. The transportation problem is basically a
(i) Maximization model (ii) Minimization model
(iii) Transshipment problem (iv) Iconic model

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Define arithmetic mean and state its merits and demerits.
OR
b Define Standard deviation.

7 a What is mean by correlation and also explain the properties of the coefficient of correlation?
OR
b What are the advantages of spearman's Rank correlation?

8 a In 600 throws of a six faced dice, odd points appeared 360 times. Would you say that the dice is fair at 5% level of significance?
OR
b Explain the procedure to solve testing of hypothesis also explain sampling attributes, sampling distribution and standard error.

9 a Test the hypothesis that $\sigma = 10$ given that $s = 15$ for a random sample of size 50 from a normal population.
OR
b Explain test of independence of attributes.

Cont...

10 a What do you mean by transportation model. Also explain degenerate basic feasible solution and optimal solution of transportation problem.

OR

b What is a project and Explain the three main phases of a project?

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Calculate standard deviation for the following data

CI	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
F	6	5	15	10	5	4	3	2

OR

b From the price of shares X and Y given below, state which share is more stable in value.

X	55	54	52	53	56	58	52	50	51	49
Y	108	107	105	105	106	107	104	103	104	101

12 a Determine the regression equations and Karl Pearson's correlation coefficient for the following

X	42	44	58	55	89	98	66
Y	56	49	53	58	65	76	58

OR

b Calculate Karl Pearson's Correlation coefficient for the following

X	100	101	102	102	100	99	97	98	96	95
f	98	99	99	97	95	92	95	94	90	91

13 a The following results are obtained from a sample of 10 boxes of biscuits:
Mean weight of contents = 490 gms
Standard deviation of the weight = 9 gms
Could the sample come from a population having a mean of 500 gms.

OR

b In two large populations, there are 30 and 25 per cent respectively of blue-eyed people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations?

14 a Out of 8000 graduates in a town 800 are females, out of 1600 graduate employed 120 are females. Test if any distinction is made in appointment on the basis of sex.

OR

b Explain in detail about sign test and Run test.

15 a Calculate the earliest start, earliest finish, latest start and latest finish of each activity of the project given below and determine the critical path of the project.

Activity	1-2	1-3	1-5	2-3	2-4	3-4	3-5	3-6	4-6	5-6
Duration (in weeks)	8	7	12	4	10	3	5	10	7	4

OR

b Solve the following transportation problem to maximize profit.

		Destination				
		A	B	C	D	Supply
Origin	1	40	25	22	33	100
	2	44	35	30	30	30
	3	38	38	28	30	70
	Demand	40	20	60	30	

Z-Z-Z

END