

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MCA DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – COMPUTER APPLICATIONS

STATISTICAL METHODS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. The dispersion measure is.
(i) Variance (ii) G.M (iii) H.M (iv) Mode
2. The correlation coefficient lies between
(i) $-1 \leq r \leq 1$ (ii) $r \geq 0$ (iii) $r \leq 0$ (iv) $r = 1$
3. To test the mean of the Binomial distribution is
(i) npq (ii) np (iii) α (iv) μ
4. Test for dependent samples is used as
(i) Paired t- test (ii) Small sample t-test
(iii) Z-test (iv) Large sample test
5. Testing independence of attributes the statistical test is
(i) F-test (ii) Sign test (iii) Run test (iv) χ^2 test

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a) List out the merits and demerits of measures central tendency.
(OR)
b) Calculate M.D for the following 10 students who obtained their aptitude scores as 15, 12, 8, 10,13, 7,5, 18,4, 3.
7. a) The 10 years Investment (X) of a computer company and its profit (Y) are given below. Apply Pearson's correlation coefficient and offer your comments.

Investment (X) Rs. in Lakhs	10	20	15	17	18	20	22	25	28	30
Profit (Y) Rs. in Lakhs	2	2.5	3	4	4.8	5.2	5.5	6	6.2	6.5

(OR)

- b) Differentiate between correlation and regression analysis.
8. a) A male and female students appear for an interview for two vacancies for the post of Computer Programmer. The probability of selecting male student is $1/7$ and that of female is $1/5$. What is the probability that
 - i) Both of them will be selected
 - ii) Only one of them will be selected
 - iii) None of them will be selected(OR)
b) List the properties of Normal Distribution.

Cont...

9. a) Differentiate large and small sample tests.

(OR)

b) An automatic machine fills in tea in sealed tins with weight of tea 1 kg and S.D 1gm. A random sample of 50 tins was examined and it was found that their Mean weight was 999.50gms. Can we conclude that, the machine is working properly or not.

10. a) Explain the one way classification of analysis of variance.

(OR)

b) A random sample of 15 students is selected from a University and their heights (in Cms) are given below. Test whether the median height of the students is regarded as 145 or not. Test at 5% level of significance.

142	144	148	149	152	142	150	146	145	150	149	142	141	146	148
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SECTION - C (30Marks)

Answer ALL Questions.

ALL Questions Carry EQUAL Marks

(5X6=30 Marks)

11. a) From the following frequency table, calculate mean, median and mode value of 46 chips.

Memory Capacity in GB.	130-135	135-140	140-145	145-150	150-155	155-160	160-165	165-170
No.of Chips	9	6	10	5	7	3	4	2

(OR)

b) The eight problems are worked out by two different processes. The problems and their speed (mbps) are given in the table:

Problem	1	2	3	4	5	6	7	8
Speed of Processor I	57	58	40	50	70	30	25	10
Speed of Processor II	60	62	70	72	85	87	90	95

Check whether which processor is more consistent.

12. a) Illustrate the types of correlation with suitable scatter diagrams.

(OR)

b)

RAM size (X) in G.B	10	15	20	25	35	40	45	50	60
Speed (Y) in G.B	50	60	70	80	90	100	110	120	130

Obtain the two regression equation and estimate the speed when RAM size is 65.

13. a) State and prove the addition and multiplication theorem of probability.

(OR)

b) A manufacturer of pins knows that 2% of his products are defective. If a person sells pins in boxes of 100 and guarantees that not more than 4 pins will be defective, what is the probability that a box will fail to meet the guaranteed quality? ($e^{-2} = 0.13534$).

14. a) In a sample of 600 men from a certain city, 450 men are found to be smokers. In a sample of 900 from another city 450 are found to be smokers. Do the data indicate that the two cities are significantly different with respect to prevalence of smoking habit among men?

(OR)

14. b) A company arranged an intensive training programme for its team of salesmen. A random sample of 10 salesmen was selected and the value(in'000) of their sales made in the weeks immediately before and after the programme are shown in the following table.

Sales man	1	2	3	4	5	6	7	8	9	10
Sales Before	12	23	5	18	10	21	19	15	8	14
Sales After	18	22	15	21	13	22	17	19	12	16

Test whether there is a significant evidence of an increase in mean sales.

15. a) Time taken by two programmers for programming their project works in two different methods are given below;

Method I(Time in hrs)	20	16	26	27	23	22	
Method II(Time in hrs)	27	33	42	35	32	34	38

Test whether variance of two methods is equal or not.

(OR)

- b) Two independent samples of 15 each from two Universities namely, Annamalai University (A) and Banaras Hindu University (B) are drawn. The scores obtained by the students of these two universities in an aptitude test are given in the table. Test whether two universities students' aptitude score differ or not by using Mann Whitney U test.

A	93	85	79	86	84	94	81	87	77	74	75	69	68	59	72
B	88	90	63	71	73	76	67	82	80	80	96	70	69	61	78

Z-Z-Z

END