TOTAL PAGES : 3

18CAP04

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MCA DEGREE EXAMINATION DECEMBER 2018
(First Semester)

Branch - COMPUTER APPLICATIONS

STATISTICAL METHODS

Time:,Three Hours Maximum: 75 Marks

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

Given that mean = 25, mode = 24, the median is
(i) 24 (ii) 24.67
(iii) 25 (iv) 24.5

Quartile deviation is calculated by the formula :

(0 $\frac{(Q_1+Q_3)}{2}$ (ii) $\frac{(Q_3-Q_1)}{2}$

(iii) (Q_1-Q_3) **(iv)** (Q_1+Q_3)

Formula for finding Spearman's rank correlation is

(i) R= 1 + $\frac{6 \pounds d^2}{n^3-n}$ (ii) R= 1 - $\frac{\hat{} 2 6ZH}{n^3-n}$

(iii) R = 1 + $\frac{6ld^2}{n^2-n}$ (iv) R= 1 -+ $\frac{«E<^*}{n}$

The p.d.f of poisson distribution is

(i) P(x) $\frac{, e\sim V}{x!}$ (ii) P(x) $\frac{p^x q^{n\sim x}}{V^{v****x}2}$

(iii) P(x)= $\frac{}{V.}$ (iv) P(x)= $\frac{f n\hat{}}{v^{x/}}$

Type I error occurs when we
(i) reject a false null hypothesis (ii) reject a true null hypothesis
(iii) do not reject a false null hypothesis (iv) do not reject a true null hypothesis

The standard deviation of a sample mean is called
(i) sampling error (ii) mean deviation
(iii) standard error (iv) type II error

7 The test statistics for testing two variances is

(i) F = —\r-;S^2 <S_2 (ii) $\frac{S? .o2}{} > {}^{o2}t^{o2} > 2$

(iii) F $\frac{^{s}? .o2_{<b}l \ «2}{Si^2}$ (iv) F-^L-jSf-sl S_2^2

For testing of more than two means, we use
(i) t test (ii) F-test

9 A run is defined as %
(i) succession of values with a +ve sign (ii) succession of values with a -ve sign
(iii) succession of values with the same sign (iv) all the above

10 Mann-Whitney U test is used for testing
(i) equality of two means (ii) equality of more than two means
(iii) equality of two sets of ranks (iv) equality of two variances

SECTION - B (25 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 5 = 25)

11 a Distinguish between absolute and relative measures of dispersion.

OR

b Determine the standard deviation weights of 100 persons from the following frequency distribution :

Weights (in kg) :	40 | 45	50	55	60	65	70	75
No. of persons :	**1** 5 **1** 7	12	20	26	18	10	2

12 a Apply the suitable correlation coefficient for the following :

Fertilizer used (metric tons) :	15	18	20	24	30	35	40	50
Productivity (metric tons) :	85	93	95	105	120	130	150	160

OR

b State the properties of regression.

13 a Explain the various steps involved in testing of hypothesis.

OR

b A sample of 300 female students is found to have a mean height of 161.38 cms. Can it be reasonably regarded as a sample from a large population with mean height 161.17 cms and standard deviation 3.10 cms?

14 a Explain the procedure for testing the equality of two variances.

OR

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

15 a Discus briefly about non-parametric test.

OR

b In a certain sample of 2000 families 1400 families consume tea, out of 1800 Hindu families, 1236 families consume tea. Use chi-square test and stage whether there is any significant difference between consumption of tea among Hindu and non Hindu families.

SECTION -C (40 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 8 = 40)

16 a Find mean, median and mode for the following date :

Marks :	0-19	20-39	40-59	60-79	80-99
Number of students :	8	12	30	20	10

OR

b Goals scored by two teams A and B in a foot ball match were as follows :

i Number of goals scored in a match :	0	1	2	3	4

b Cont...
Find coefficient of variation in each case and justify which team may be considered more consistent.

17 a State and prove the addition and multiplication theorem on probabilities.

OR

b Height of the father and son is given below. Find the height of son when the ° height if father is 70 inches :

Father's ht (inches) :	71	68	66	67	70	71	70	73	72	65	66
Son's ht (inches) :	I. 69	64	65	63	65	62	65	64	66	69	62

18 a Intelligence test on two groups of boys and girls gave the following results :

	Sample	Mean	SD
Boys	250	70	20
Girls	150	75	15

Is there a significant difference in the mean scores obtained by boys anc girls?

OR

b i) Define type I and type II errors.

ii) A machine puts out 16 imperfect articles in a sample of 500. After the machine overhauled, it puts out 3 imperfect articles in a batch of 100. Has the machine improved?

19 a A company is testing two machines, A random sample of 8 employees is selected and each employees uses each machine for one hour. The number of components produced is shown in the allowing able :

Employee :	r1[1]	2	3	4	5	6	7	8
I machine :	96	107	84	99	102	87	93	101
II machine :	99	112	90	97	108	97	94	98

Test whether there is any significant difference between the means of the components produced.

OR

b The following figures relate to sales of three branches A, B and C of

Brand A :	20	18	19		
Brand B :	17	16	19	18	
Brand C :	20	21	20	10	18

Is there any significant difference in the sa es of the three brands?

20 a From the following data find out whether there is any association between gender and preference of colours :

Gender	Colours		
	Red	Blue	Green
Males	10	70	30
Females	40	30	20

OR

b The win -loss record of a certain football team for their last 50 consecutive games was as follows :
W W W W W W L L W W W L L W W W W L L L W W W W L
L L L W W W W W L L W L L L L W W W L L W W W L W
Apply run test to test sequence of wins and losses in random.