

**PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)**

**BCA DEGREE EXAMINATION DECEMBER 2018  
(First Semester)**

Branch - **COMPUTER APPLICATIONS**

**STATISTICS & OPERATIONS RESEARCH**

Time: Three Hours

Maximum: 75 Marks

**SECTION-A (10 Marks)**

Answer **ALL** questions

**ALL** questions carry **EQUAL** marks (10 x 1 = 10)

- 1 Histogram can be used only when
  - (i) Class Intervals are equal or unequal
  - (ii) Class Intervals are all equal
  - (iii) Class Intervals are unequal
  - (iv) Frequencies in class interval are equal
- 2 Co-efficient of SD is given by the formula:
  - (i)  $\frac{SD}{Mean} \times 100$  (ii)  $\frac{SD}{QD} \times 100$  (iii)  $\frac{Mean}{SD} \times 100$  (iv)  $\frac{SD}{Median} \times 100$
- 3 If  $b_{yx} < 1$ , then  $b_{xy}$  is
  - (i) less than 1 (ii) greater than 1 (iii) equal to 1 (iv) equal to 0
- 4 Testing of hypothesis  $H_0 : p = 70$  vs  $H_1 : p > 70$  leads to
  - (i) one sided left tailed test (ii) one sided right tailed test
  - (iii) two tailed test (iv) None of the above
- 5 ANOVA is used to test
  - (i) Equality of two means (ii) Equality of variances
  - (iii) Equality of more than two means (iv) None of the above
- 6 Goodness of fit can be tested by
  - (i) Bartlett's test (ii) F-test (iii)  $\chi^2$  -test (iv) t-test
- 7 A necessary and sufficient condition for a basic feasible solution, in case of minimization of LPP, to be an optimum is
  - (i)  $z_i - c_j > 0$  (ii)  $z_i - c_j < 0$  (iii)  $z_i - c_j = 0$  (iv)  $z_i - c_j > 0$  or  $z_i - c_j < 0$
- 8 Decision variables in an O.R. Model are
  - (i) Controllable (ii) Uncontrollable (iii) Parameters (iv) Constants
- 9 The transportation problem is balanced if
  - (i) total demand and total supply are equal and the number of origins equals the number of destinations
  - (ii) total demand equals total supply irrespective of the number of origins and destinations
  - (iii) No. of origins equal to No. of destinations
  - (iv) None of the above
- 10 Network problems have advantage in terms of project
  - (i) scheduling (ii) planning
  - (iii) controlling (iv) All of the above

**SECTION - B (25 Marks)**

Answer **ALL** questions

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

Calculate Mean from the following data.					
i Marks	4	8	12	16	20
No. of Students	6	12	18	15	9

OR

12 a Write a short note on scatter diagram.

OR

Calculate the Spearman's rank correlation coefficient for the given data:

X	1	2	3	4	5	6	7	8	9	10
Y	4	1	2	5	3	9	7	10	6	8

13 a Explain the test procedure of t-test for single mean.

OR

b List out the various applications of chi-square distribution.

14 a Explain the limitations of OR.

OR

b Write down the Algorithm for Simplex Method.

15 a Write the difference between PERT and CPM.

OR

b Obtain an IBFS to the following transportation problem using the North West corner rule.

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Availability
O <sub>1</sub>	1	2	1	4	30
O <sub>2</sub>	3	3	2	1	50
O <sub>3</sub>	4	2	5	9	20
Requirement	20	40	30	10	

**SECTION -C (40 Marks)**

Answer ALL questions

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

16 a Calculate the mode for the following frequency distribution.

C.I	10-15	15-20	20-25	25-30	30-35
Freq	40	62	75	100	65

OR

b Calculate the coefficient of variation for the following data:

40,41,45,49,50,51,55,59,60,60.

17 a Calculate coefficient of correlation from the data given below

X	180	155	170	174	160	172	166	172	172
Y	170	165	180	180	164	169	170	no	174

OR

b In a Sample of 1000 people in Maharashtra, 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in this state at 1 % level of significance.

18 a Explain t-test for testing the significance of difference between sample mean and population mean for small samples.

OR

b Two random samples drawn from the two normal population:

Sample I	20	16	26	27	23	22	18	24	25	19
Sample II	27	33	35	32	34	38	28	41	43	

Test the equality of variances.

19 a Solve the following LPP by graphical method.

Maximize  $z=3x_1+4x_2$   
s. to  $2x_1+5x_2<120$

$4x_1+2x_2<80; \quad x_1,x_2>0.$

OR

b Explain the characteristics and phases of OR.

20 a Construct a network for the project whose activities and their procedure relationship are given below:

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	.	.	.	A	.	B	C	D	E	H,I	F,G

OR