PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – **COMMERCE(e-COMMERCE)**

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. In linear programming problem which satisfies the non-negativity restriction of basic is called _____.
   (i) solution (ii) feasible solution
   (iii) both (iv) none of the above

2. Basic feasible solution is a _____.
   (i) non-degenerate basic feasible solution (ii) degenerate basic feasible solution
   (iii) both (a) and (b) (iv) none of the above

3. Simplex method starts with a initialization, which is called _____.
   (i) solution (ii) feasible solution
   (iii) basic feasible solution (iv) all the above

4. A basic solution to the system Ax = b is called degenerate if _____.
   (i) only one basic variable vanish (ii) one or more of the basic variables vanish
   (iii) both (iv) none of the above

5. The number of basic variables in an $m \times n$ transport table are _____.
   (i) m + n (ii) m + n + 1 (iii) m + n -1 (iv) mn

6. An ordered set of at least four cells in a transportation table is said to form a loop provided _____.
   (i) any two adjacent cells of the ordered set lie either in the same row or in the same column
   (ii) no three or more adjacent cells in the ordered set lie in the same row or column.
   (iii) both (a) and (b)
   (iv) none of the above

7. The objective of the assignment problem is _____.
   (i) to maximize overall profit (ii) to minimize overall cost
   (iii) both (a) and (b) (iv) none of the above

8. Networks are also called _____.
   (i) arrow diagram (ii) diagram (iii) both (iv) none

9. PERT stands for _____.
   (i) Programme Emerging and Review Technique
   (ii) Programme Evaluation and Revised Technique
   (iii) Programme Evaluation and Review Technique
   (iv) none of the above

10. _____ are "Activity – oriented" placing the emphasis on the descriptions associated with activities in a network.
    (i) PERT (ii) CPM (iii) both (iv) none

Cont...

SECTION - B (35 Marks)

Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 (a) Solve the following linear programming problem by graphical method.

Minimizing $Z = 20x_1 + 10x_2$

Subject to, $x_1 + 2x_2 \leq 40$

$3x_1 + x_2 \geq 30$

$4x_1 + 3x_2 \geq 60$

$x_1, x_2 \geq 0$

(OR)

(b) State the uses and limitations of operations research.

12 (a) Differentiate transportation and assignment problems.

(OR)

(b) Explain briefly about MODI method.

13 (a) What is replacement problem? Describe the various types of replacement policies.

(OR)

(b) Elucidate money value fixed and money value changes with time models.

14 (a) Describe Johnson's rule for n jobs.

(OR)

(b) Illustrate the characteristics of queuing system.

15 (a) State the advantages of PERT and CPM.

(OR)

(b) Give a step-by-step procedure for the critical path method.

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Explain the operating procedure of simplex method.

17 Find the initial solution to the following transportation problem using Vogel's approximation method.

		Destination				
		D_1	D_2	D_3	D_4	Supply
Factory	F_1	3	3	4	1	100
	F_2	4	2	4	2	125
	F_3	1	5	3	2	75
	demand	120	80	75	25	300

18 Explain individual and group replacement policy models with suitable illustrations.

19 Describe in detail about (M/M/1:∞/FIFO) queuing model with examples.

20 Elucidate about construction of network techniques with appropriate real life examples.

Z-Z-Z END