D 51545 **(Pages 3)** **Name**

Reg. No.....

THIRD SEMESTER B.C.A. DEGREE EXAMINATION, NOVEMBER 2013

(UG-CCSS)

B.C.A. – Complementary Course

CA 3C 06—OPERATION RESEARCH

Time : Three Hours Maximum : 30 Weightage

Part I

Answer **all** *twelve questions.*

1. Operations Research achieved recognition as a subject of academic study in the year :

(a) 1949. (b) 1950.

(c) 1953. (d) 1957.

2. The general linear programming problem is in standard form, if :

(a) The constraints are strict equations.

(b) The constraints are inequalities of < type.

(c) The constraints are inequalities of > type.

(d) The decision variables are unrestricted in sign.

3. In a maximization LPP, if at least one artificial variable is in the basis, but not at zero level and the coefficient of **M** in each of the net evaluation $(z_j - c_j)$ is non-negative, then we have :

(a) a Feasible solution. (b) No feasible solution.

(c) an Unbounded solution. (d) an Optimum solution.

4. Given a system of m simultaneous linear equations in n unknowns (m < n), the number of basic variables will be :

(a) m. (b) n.

(c) n – m. (d) n + m.

5. Which of the following is not correct ?

(a) It is not necessary for the aggregate demand to be equal to the aggregate supply in a transportation problem.

(b) An unbalanced transportation problem must be converted into a balanced problem before solving it.

(c) The cost elements in a dummy row/column shall always taken equal to zero.

(d) It is possible that in some cases both, the dummy source and dummy destination may be required to convert an unbalanced transportation problem into a balanced one.

Turn over

6. **The word linear stands for indicating that all relationships involved in a particular problem are _____**

7. **When the total demand is equal to total supply, the transportation problem is said to be**

8. **The critical activities of a network that constitute an uninterrupted path which spans the entire network from start to finish is known as _____**

9. **The selection of an appropriate order for a series of jobs to be done on a finite number of service facilities, in some pre-assigned order, is called _____**

10. **Which variables are used to convert the inequalities of the type '<' into equations ?**

11. **Name one method to solve transportation problem for an initial solution ?**

12. **Name the longest path in a project network.**

(12 x = 3 weightage)

Part II

Answer **all** *nine questions.*

13. **Define (i) Basic variable ; and (ii) Basic solution.**

14. **Explain the terms (a) Non-negative constraints ; and (b) feasible solutions.**

15. **What is a balanced transportation problem ?**

16. **Explain degeneracy in a transportation problem ?**

17. **What is shortest route problem ?**

18. **What is a critical path ?**

19. **What do you mean by sequencing of jobs ?**

20. **Explain a replacement problem.**

21. **Define the term shortage or penalty cost associated with an inventory problem.**

(9 x 1 = 9 weightage)

Part III

Answer any **five** *questions.*

22. **What do you mean by two-phase method for solving a given L.P.P. ?**

23. **Define Primal Problem and Dual Problem.**

24. **What is a balanced transportation problem ? What are its applications ?**

25. **What is meant by an optimality test in a transportation problem ?**

26. **Discuss in brief replacement procedure for the items that deteriorate with time.**

27. **Describe the method of processing two jobs through '*m*' machines.**

28. **Derive the EOQ formula for the manufacturing model without shortages.**

(5 x 2 = **10** weightage)

Part W

Answer any **two** *questions.*

29. **Write the steps to solve a linear programming problem using the simplex procedure.**

30. **State the fundamental theorem of duality and explain the Dual Simplex Method.**

31. **Explain the steps for solving a transportation problem.**

(2 x 4 = 8 weightage)