M 8425

Reg. No. : .....

Name : .....

IV Semester B.A. Degree (CCSS – Reg./Supple./Imp.) Examination, May 2015

COMPLEMENTARY COURSE IN ECONOMICS

4 C04 ECO : Mathematical Economics – II

(2012 Admn. Onwards)

Time : 3 Hours Max. Weightage : 30

PART – A

I. Choose the correct answer :

1) A set of values which satisfy the constraints of the LPP is called
   a) Feasible solution
   b) Non Feasible solution
   c) Optimum solution
   d) Basic feasible solution

2) Who among the following first developed the Simplex method and solved LPP ?
   a) L. V. Kantrovitch
   b) T. C. Koopmans
   c) Von-Neumann
   d) G. B. Dantzig

3) Which of the following is not an assumption of linear programming ?
   a) Linearity
   b) Finite number of constraints
   c) Divisibility
   d) Flexible prices

4) The dual of dual is
   a) Primal
   b) Dual
   c) Feasible
   d) Optimum

(W. 1)

II. 5) A variable which is added to a constraint to convert it into equation is called
   a) Surplus variable
   b) Slack variable
   c) Artificial variable
   d) None of these

6) The full form of LPP is
   a) Linear Programming Problem
   b) Lowest Penalty Problem
   c) Both a) and b)
   d) None of these

7) Viability of the system says
   a) $|I - A|$ is always positive
   b) $|I - A|$ is negative
   c) Leading diagonal elements of $I - A$ is negative
   d) None of these

8) The term dominant strategy is associated with
   a) Input-output analysis
   b) Linear programming
   c) Game theory
   d) Integer programming

(Weightage 1)

9. Define linear programming.

10. Explain the concept of degenerate solution.

11. What do you mean by mixed strategy ?

12. Explain pay-off matrix.

13. What is Nash equilibrium ?

14. What is Hawkin-Simon condition ?

15. What do you mean by basic variables ?

16. When is a static model becomes dynamic ?

17. What is game?

18. What is a feasible region ? What will be the shape of a feasible region ?

19. What is meant by input-output analysis ?

20. What do you mean by dual problem ? **(10×1=10)**

PART – C

Answer **any 5** questions.

21. What are the limitations of linear programming ?

22. How to construct a simplex table ?

23. Find the gross output lend when the technological coefficient matrix given

$$A = \begin{bmatrix} 0.3 & 0.4 & 0.2 \\ 0.2 & 0.0 & 0.5 \\ 0.1 & 0.3 & 0.1 \end{bmatrix} \quad D = \begin{bmatrix} 140 \\ 240 \\ 220 \end{bmatrix}$$

24. Explain Prisoner's dilemma.

25. How to find the dual of a given primal ?

26. The technological matrix of a two sector economy is given by $A = \begin{bmatrix} 0.5 & 0.4 \\ 0.5 & 0.d \end{bmatrix}$.

Find the maximum value of d for which technology is viable.

27 How to construct a Simplex Algorithm ? **(Weightage 5×2=10)**

PART – D
Long Essay

28. Solve the LP problem :

Maximise $Z = 3x_1 + 5x_2 + 4x_3$

$$2x_1 + 3x_2 \leq 8$$

$$2x_2 + 5x_3 \leq 10$$

$$3x_1 + 2x_2 + 4x_3 \leq 15$$

and $x_1, x_2, x_3 \geq 0$

29. Solve graphically :

Max. $Z = x_1 - 2x_2$

$$-x_1 + x_2 \leq 1$$

$$3x_1 + 2x_2 \geq 12$$

$$0 \leq x_1 \leq 5, 2 \leq x_2 \leq 4$$

30. What do you mean by LPP ? Write down the basic assumption and requirements for employing LPP. Briefly explain the steps in the formulation of Mathematical model to a LPP.

31. Explain dominant strategy and Nash equilibria. **(Weightage 2×4=8)**
