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(Pages : 2)

FIFTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, NOVEMBER 2014

EC PTEC 09 502—QUANTITATIVE TECHNIQUES FOR MANAGERIAL DECISIONS

Time : Three Hours

Maximum : 70 Marks

Part A

*Answer **all** questions.*

1. State the difference between strategic and tactical decisions.

2. Define Critical Path.

3. What is safety stock ?

4. How the feasible solutions are reduced into basic feasible solution ?

5. State any two properties of Coefficient Matrix.

(5 × 2 = 10 marks)

Part B

*Answer any **four** questions.*

6. Explain Network Flow Problems.

7. What is a PERT ? Explain its construction with suitable example.

8. Explain selective control techniques for Inventory.

9. State and explain Duality principle.

10. Explain the degeneracy problem in transportation using Rim condition.

11. Explain the algorithm of Charnes' M method of solving linear programming.

(4 × 5 = 20 marks)

Part C

Answer the following questions.

12. (a) Explain Multistage decision making with suitable example.

Or

    (b) Discuss in detail about Bayesian Decision Theory.

13. (a) Discuss in detail about Inventory Control.

Or

    (b) Discuss in detail about dynamic inventory models.

Turn over

14. (a) A farmer has a piece of farm land, say L km², to be planted with either wheat or barley or some combination of the two. The farmer has a limited amount of fertilizer, F kilograms, and insecticide, P kilograms. Every square kilometer of wheat requires F_1 kilograms of fertilizer, and P_1 kilograms of insecticide, while every square kilometer of barley requires F_2 kilograms of fertilizer, and P_2 kilograms of insecticide. Let S_1 be the selling price of wheat per square kilometer, and S_2 be the selling price of barley. If we denote the area of land planted with wheat and barley by x_1 and x_2 respectively, then profit can be maximized by choosing optimal values for x_1 and x_2. Express this problem with the standard form of Linear Programming.

Or

(b) Minimize Z using Linear programming :

$$Z = -2x - 3y - 4z$$

Subject to :

$$3x + 2y + z \leq 10$$
$$2x + 5y + 3z \geq 15$$
$$x, y, z \geq 0$$

With the addition of slack variables s and t,

15. (a) Calculate the coefficient of variation for the following information and interpret the results :

Factory	Average Weekly Wages	Standard Deviation	No. of Workers
A	34.5	5	476
B	24.5	4.5	524

Or

(b)

	Warehouse 1	Warehouse 2	Warehouse 3	Supply
Bakery 1	3	6	7	2
Bakery 2	4	3	5	8
Bakerv 3	6	7	9	5
Supply	7	5	3	15

Find an optimal solution for maximum transportation, by :

(i) Finding an initial solution.

(ii) Testing for Optimality.

(iii) Improving the solution if not optimal using stepping stone method.

(4 × 10 = 40 marks)