Q M1 B1

a) A furniture company produces tables and chairs. The production process for each is similar in that both require a certain number of hours of carpentry work and a certain number of labour hours in the painting department. Each table takes 4 hours of carpentry and 2 hours in the painting department. Each chair requires 3 hours of carpentry and 1 hour in the painting department. During the current production period, 240 hours of carpentry time are available and 100 hours in painting is available. Each table sold yields a profit of Rs. 7; each chair produced is sold for a profit of Rs.5. Find the best combination of tables and chairs to manufacture in order to reach the maximum profit

OR

b) Solve the following LPP using graphical method:-

Minimize $Z = x_1 + x_2$

Subject to $2x_1 + x_2 \geq 4,\ x_1 + 7x_2 \geq 7,\ x_1, x_2 \geq 0$

Q M1 B2

a) An animal feed company must produce 200 kgs of a mixture consisting of ingredients x1 and x2 daily. x1 costs Rs.30 per kg and x2 Rs. 80 per kg. No more than 80kgs of x1 can be used and at least 60 kgs of x2 must be used .Formulate this LPP and using graphical method of solution, find how much of each ingredient should be used if the company wants minimum cost

OR

b) Solve the following LPP using graphical method:-

Max $P = 2x + 3y$ Subject to $x+y \leq 30,\ y \geq 5,\ 0 \leq y \leq 15, 0 \leq x \leq 20,\ x-y \geq 0$

Q M1 B3

a) A company produces two types of hats. Each hat of the first type requires twice as much labour time as the second type. If all hats are of the second type only, the company can produce a total of 500 hats a day. The market limits daily sales of the first and second types to 150 and 250 hats. Assuming the profit per hat is Rs. 8 for type 1 and Rs. 5 for type 2, formulate the problem as a linear programming model in order to determine the number of hats to be produced of each type so as to maximise the profit. Also solve the problem graphically

OR

b) Solve the following LPP using graphical method:-

Min $C = 3x+5y$ Subject to $-3x+4y \leq 12$, $2x-y \geq -2$, $2x+3y \geq 12$, $x \leq 4$, $y \geq 2$, and $x, y \geq 0$

Q M1 B4

a) A company produces two articles A and B. There are two different departments through which the articles are processed such as assembly and finishing. The potential capacity of the assembly department is 60 hours a week and that of the finishing department is 48 hours a week.The production of one unit of A requires 4 hours in assembly and 2 hours in finishing. Each of unit B requires 2 hours in assembly and 4 hours in finishing. If profits are Rs.8 for each unit of A and Rs.6 for each unit of B, find out the number of units of A and B to be produced each week to get the maximum profit. Use Graphical method and shade the region of feasible solution

OR

b) Solve the following LPP using graphical method:-

Max $P = 2x+3y$ Subject to $x + 2y \leq 2$, $4x+3y \geq 12$ and $x, y \geq 0$

Q M1 B5

a) A paint manufacturer produces two types of paint, one type of standard quality (S) and the other of top quality (T). To make these paints, he needs two ingredients, the pigment and the resin. Standard quality paint requires 2 units of pigment and 3 units of resin for each unit made, and is sold at a profit of R1 per unit. Top quality paint requires 4 units of pigment and 2 units of resin for each unit made, and is sold at a profit of R1.50 per unit. He has stocks of 12 units of pigment, and 10 units of resin. Formulate the above problem as a linear programming problem to maximize his profit? Solve the problem using Graphical method

OR

b) Solve the following LPP using graphical method:-

Min $C = 3x+5y$ Subject to $-3x+4y \leq 12$, $2x-y \geq -2$, $2x+3y \geq 12$, $x \leq 4$, $y \geq 2$, and $x, y \geq 0$