Course Code: 11B1WMA832
Course Name: Linear Programming and Applications
Course Credits: 03

MAX. MARKS: 35

MAX. TIME: 2 Hrs

Note: In total there are 7 questions. All questions are compulsory.
Carrying of mobile phone during examinations will be treated as case of unfair means.
Marks are indicated in square brackets against each question.

Q1.P and Q are two types of packets of breakfast. A person requires 24 units of calcium,25 units of proteins and 18 units of carbohydrates daily. Packet P contains 6 units of calcium, 5 units of protein and 3 units of carbohydrates. Packet Q contains 4 units of calcium, 7 units of protein and 2 units of carbohydrates. The price of packet P is Rs.5 and that of Q is Rs.9.Formulate the problem as linear programming problem to obtain the optimum combination so that the customer gets the minimum requirements of calcium, protein and carbohydrates. Also solve the problem by graphical method.

[5](CO-1)

Q2.Solve the assignment problem

[5](CO-4)

Person/Jobs	1	2	3	4	5
A	27	18	35	20	21
B	31	24	21	12	17
C	20	17	20	25	16
D	21	28	20	16	27

Q3.Write mathematical form of transportation problem.

[2](CO-5)

Q4.Solve the transportation problem

[7](CO-5)

Source/Destination	D1	D2	D3	D4	Capacity
S1	27	23	31	69	150
S2	10	45	40	32	40
S3	30	54	35	57	80
Requirement	90	70	50	60	

Q5.Solve the I.P.P using Gomorian method

$$Max\ Z = 2x_1 + 2x_2$$

s/t $5x_1 + 3x_2 \leq 8$, $x_1 + 2x_2 \leq 4$

$x_1, x_2 \geq 0$ *and Integers*

[7](CO-6)

Q6.Find the job sequence, for the following eight jobs, that will minimize the total elapsed time for the completion of jobs. Each job is processed in the order CAB.

Machine/Jobs	1	2	3	4	5	6	7	8
A	4	6	3	4	5	3	6	2
B	8	10	7	8	11	8	9	13
C	5	6	2	3	4	9	15	11

Also find total elapsed time and idle time for each machine. [7](CO-7)

Q7.Define CPM and PERT and list three areas where it CPM and PERT can be used. [2](CO-8)