Code No: **R31032** **R10** **Set No. 1**

III B.Tech I Semester Supplementary Examinations, October/November -2017

OPERATIONS RESEARCH

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1 a) Describe the different methods of solving O.R. models. [7M]

b) Solve the following using graphical method [8M]

maximize Z= 9x + 10y subject to

$11x + 9y \leq 9900$

$7x + 12y \leq 8400$

$6x + 16y \leq 9600$ and

$x \geq 0, y \geq 0$

2 a) Using following cost matrix, assign the different contractors to different jobs so as to minimize total cost: [7M]

Jobs	Contractors A	B	C	D
X	17	20	13	21
Y	15	21	14	18
Z	17	18	17	21
L	14	22	12	22

b) What is sequencing problem? Explain the following terms in context of sequence problems: [8M]
i) Total elaspsed time and Ide time ii) no passing rule iii) processing order.

3 a) Discuss in brief, replacement procedure for the items that deteriorate with time. [7M]

b) The initial cost of an item is Rs15000 and maintenance and running cost (in Rs) for different years are given below: [8M]

Year	1	2	3	4	5	6	7
Running cost	2500	3000	4000	5000	6500	8000	10000

What is the replacement policy to be adopted if the capital worth is 10% and there is no salvage value?

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4 a) Solve the following game graphically where pay off matrix for player A has been prepared. [7M]

Player A

Player B					
	1	5	-7	4	2
	2	4	9	-3	1

b) Briefly explain the limitations of game theory. [8M]

5 a) In a railway station only one train is handled at a time. The railway yard is sufficient for 2 trains to wait while others is given signal to leave the station. Trains arrive at a station at a average of 6 per hour and the railway station can handle them at an average rate of 12 per hour. Assuming Poisson arrival and exponential service distribution, find the probabilities for the number of trains in the system. Also find the average waiting time in the stations of new train coming into the yard. [7M]

b) State some of the important distributions of arrival intervals and service times. [8M]

6 a) Describe the basic characteristics of an inventory system. [7M]

b) What are costs that are involved in carrying inventory? Explain them in detail. [8M]

7 a) Discuss the relation between linear and dynamic programming. [7M]

b) Solve the following problem by using dynamic programming: [8M]

Max. $Z = 2x_1 + 9x_2$ subject to

$2x_1 + x_2 \leq 25$

$x_2 \leq 11$

$x_1, x_2 \geq 0$.

8 a) A Grocery store, the daily demand of bread over a 100 days period has the following frequency distribution. [7M]

Daily demand	0	1	2	3	4	5
No of days	5	25	35	20	5	10

Using the above data, simulate a 10 day sequence of the demand of bread.

b) Write a short note on the essential features of Simulation Languages. [8M]

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