Sanjay Ghodawat University, Kolhapur

2020-21

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EXM/P/09/00

Year and Program:	**School of Commerce and Management**	**Department:**
Course Code: MBC 201	**Course Title: Operation Research Techniques**	**Semester :III**
Day and Date:	**Re End Semester Examination**	**Time:2 Hrs.** **Max Marks:50**

QUESTION PAPER

Instructions: 1) All Questions are compulsory.

Q.1 **Answer the following (any Two)**–

Marks **Bloom's Level** **CO**

a) Explain the application of the operation research techniques. 9 L2 CO1

b) A company has 4 machines that are to be used for 3 Jobs. Each job can be assigned to one and only one machine. The cost of each job on each machine is given in the following table. 9 L3 CO2

Jobs	Machine			
	W	X	Y	Z
A	18	24	28	32
B	8	13	17	18
C	10	15	19	22

c) A manufacturing company makes two models A and B of a product. Each piece of model A requires 9 labors hours for fabricating and 1 labour hour for finishing. Each piece of model B requires 12 labour hours for fabricating and 3 labour hours for finishing. For fabricating and finishing the maximum labour hours available are 180 and 30 respectively. The company makes a profit of Rs.8000 and on each piece of model A and Rs. 12000 on each piece of model B. How many piece of model A and Model B should be manufactured per week to realize a maximum Profit.What s maximum profit per week. 9 L3 CO2

Q.2 **Answer the following (any two) –**

a) Find the optimum transportation schedule using VAM method and minimum total cost of transportation. 8 L3 CO4

Company	Retail			
	R1	**R2`**	**R3**	**Supply**
P1	10	7	8	45
P2	15	12	9	15
P3	7	8	12	40
Demand	25	55	20	

b) ABC company produces a cable at the rate of 5000 meter per hour. The demand used at the rate of 2500 meter/hour. The cost of the cable is Rs.25 per meter. The inventory carrying cost is 25 percent and set-up costs are Rs.4050 per set-up. Determine the optimal number of required in a year for the manufacture of this cable. 8 L2 CO5

c) Explain with suitable examples the different costs that are involved in inventory problems. 8 L1 CO1

Q.3 **Answer the following (any two) –**

a) The following is the list of the activities associated with the assembly of a space module for an upcoming mission. Draw the network diagram of activities involved in the project and calculate completion period. 8 L4 CO5

Name of Activity	Immediate Predecessor	Time Duration
A	-	4
B	A	5
C	B	2
D	B	2
E	C	1
F	D	1

b) The following is a payoff (in rupees) table for three strategies and two state of nature 8 L2 CO5

Strategy	State of nature	
	N1	**N2**
S1	60	80
S2	30	-50
S3	- 60	170

Select a strategy using each of the following decision criteria a) Maximaxb)Minimax Regret c) Maximin

c) The Following details are available for the project. Draw the network and calculate the project completion period and critical path. 8 L3 CO5

Activity	Immediate Predecessor	Optimistic time	Most likely time	Pessimistic time
A	-	2	4	6
B	-	6	6	6
C	-	6	12	24
D	A	2	5	8
E	A	11	14	23
F	B,D	8	10	12
G	B,D	3	6	9
H	C,F	9	15	27
I	E	4	10	16

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