

[6580]-568

B.E. (Mechanical) (Insem.)

OPERATIONS RESEARCH (Elective-IV)

(2019 Pattern) (Semester - VII) (402045D)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Draw suitable neat diagrams, whenever necessary.
- 2) Figure to the right indicate full marks.
- 3) Assume suitable data if required.

UNIT - I**Introduction to OR, Theory of Games, Decision analysis**

Q1) a) What is OR? What are the characteristics of OR? Explain the limitations of OR. [7]

b) The following matrix gives the payoffs of different strategies S1,S2,S3 against conditions N1 ,N2,N3,N4. [8]

	N1	N2	N3	N4
S1	4000	-100	6000	18000
S2	20000	5000	400	0
S3	20000	15000	-2000	1000

Indicate the decision take under the following approach : -

- i) Pessimistic
- ii) Optimistic
- iii) Regret
- iv) Equal probability

OR

Q2) a) Explain different types of decision making environments. [5]

b) Reduce the game by dominance and find the game value : - [10]

		Player B			
		I	II	III	IV
Player A	I	3	2	4	0
	II	3	4	2	4
	III	4	2	4	0
	IV	0	4	0	8

P.T.O.

UNIT - II

Queuing theory and sequencing Model

- Q3)** a) Discuss the assumptions and limitations of a queuing model. [5]
- b) A self-service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes while the cashier can serve 10 customers in 5 minutes. Assuming Poisson distribution for arrival rate and exponential distribution for service time, find [10]
- Average number of customers in the system
 - Average number of customers in the queue or average queue length.
 - Average time a customer spends in the system
 - Average time a customer waits before being served.

OR

- Q4)** a) A person repairing radios finds that the time spent on the radio sets has exponential distribution with mean 20 minutes. If the radios are repaired in the order in which they come in and their arrival is approximately Poisson with an average rate of 15 for 8-hour day, what is the repairman's expected idle time each day? How many jobs are ahead of the average set just brought in? [10]
- b) Explain the importance of sequencing problems and state the assumptions made while solving sequencing problems. [5]

