

FF346

B. Sc. (Hons.)/M. Sc. (Mathematics) EXAMINATION, 2020

(5 Years Integrated Course)

(Sixth Semester)

(B. Scheme) (Re-appear)

OPERATIONS RESEARCH-II

MAT422H

Time : 2½ Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Four* questions in all. All questions carry equal marks.

1. Define Inventory. What are the different factors affecting inventory ?
2. A contractor has to supply 10,000 bearing per day to an automobile manufacture. He finds that when he starts production run, he can produce 25000 bearing per day. The cost of holding a bearing in stock for a year is Rs. 200 and the set up cost of a production run is Rs. 1,800. How frequently should production run be made ?
3. Explain M/M/1 queues model in the transient state. Derive steady state solution for the M/M/1 queues model.
4. Customers arrive at a sales counter manned by a single person according to a Poisson process with a mean rate of 20 per hour. The time required to serve a customer has an exponential distribution with a mean of 100 seconds. Find the average waiting time of a customer.

5. Use Graphical method to minimize the time needed to process the following jobs on the machines shown below i.e. for each machine. Find the job which should be done first. Also calculate the total time needed to complete both the jobs :

Job 1		Job 2	
Sequence of Machine	Time	Sequence of Machine	Time
A	2	C	4
B	3	A	5
C	4	D	3
D	6	E	2
E	2	B	6

6. A pipeline is due for repairs. The repair cost will be Rs. 10,000 and would last for three years. Alternately, a new pipeline can be laid at a cost of Rs. 30,000 which would for 10 years. Assuming the cost of capital to be 10% and ignoring salvage value, which alternative should be chosen ?
7. The utility data for a network are given below. Determine the total, free, independent and interfering floats and identify the critical path :

Activity	:	0-1	1-2	1-3	2-4	2-5	3-4	3-6	4-7	5-7	6-7
Duration	:	2	8	10	6	3	3	7	5	2	8

8. Write brief notes on the following :
- (a) Critical path analysis
 - (b) Project scheduling with uncertain activity times
 - (c) Project time-cost trade off.