

B.B.A. Semester - 6 (CBCS) Examination**May/June-2021 (OLD COURSE)****ADVANCED RESEARCH OPERATION TECHNIQUES(ELECTIVE)****Time: 1:30 Hours****Marks: 42****Instructions:**

1. Figure to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

- Q.1(A) Six jobs go first on machine A, then machine B and lastly on machine C. The order of the completion of jobs has no significance. The following table gives machine time for the six jobs on three machine. (07)

	Processing time (in Hours)		
Jobs	Machine A	Machine B	Machine C
1	8	3	8
2	3	4	7
3	7	5	6
4	2	2	9
5	5	1	10
6	1	6	9

Find the sequence of the jobs that minimize elapsed time to complete the jobs. Find also the idle time of the Machines A,B,C

- Q.1(B) A TV company has six plants located in different parts of a city. Every year, it is necessary for each plant to be completely overhauled. The overhauling is carried out in two stages A and B, and each stage requires a crew of workman with completely different skills. The work on stage B can start only when stage A has been completed. The plant has to be closed for entire period of its overhauling. the present schedule of the overhaul of the six plants as follows: (07)

	Time required by crew(days)					
Plant	P1	P2	P3	P4	P5	P6
Crew A	10	10	8	10	9	12
Crew B	8	6	14	9	7	10

- A. Determine the optimal sequence.
 - B. If the down time of any six plants costs rs.4,000 per day for a plant, idle time for Crew A costs Rs.1250 per day, and idle time for Crew B costs Rs.2,150 per day, which of the two schedule, the present one and optimal will be more economical? What are their respective costs?
- Q.2(A) What is replacement? Describe some important replacement situations and replacement policies. (07)

- Q.2(B) An Equipment which cost Rs. 15,000 has to be replaced with new equipment. The following data have been estimated: (07)

Year	1	2	3	4	5	6	7	8
Resale value	12,000	9,500	7,500	5,700	4,200	3,900	2,900	2,000
Annual maintenance cost	600	800	1,050	1,400	2,100	3,500	5,000	6,800

Find minimum average cost for replacement

- Q.3(A) Solve the game (07)

Player B					
Player A	B1	B2	B3	B4	B5
A1	4	2	1	7	3
A2	2	7	8	1	5

- Q.3(B) Solve the game (07)

Player A			
Player A	B1	B2	B3
A1	0	2	2
A2	3	-1	3
A3	4	4	-2

- Q.4(A) Give difference between PERT and CPM (07)

- Q.4(B) For the following activities determine (07)

- Critical Path using PERT
- Calculate variance and S.D. for each activity
- Calculate the probability of completing the project in 26 days

Activity	1-2	1-3	2-4	3-4	3-5	2-6	4-6	5-6
To	6	3	2	4	1	5	7	1
Tm	9	4	5	6	1.5	6	8	2
Tp	12	11	14	8	5	7	15	3

- Q.5(A) A shopkeeper has 500 units of refrigerators to be supplied per year to his customers. The demand is fixed. The inventory holding cost is Rs. 200 per unit and the ordering cost is rs.80.Determine (07)

- Optimum lot size
- Optimal total variable cost
- Optimal period of order to be place
- Number of total orders to be placed in a year.

- Q.5(B) Explain Inventory Model (07)
