

B.B.A. Semester - 6 (CBCS) Examination**March/April -2019****ADVANCED RESEARCH OPERATION TECHNIQUES(ELECTIVE)****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q-1 (A) What is sequencing problem? Explain and illustrate. (07)

Q-1 (B) A refrigeration 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 the entire period of its overhauling. The present schedule of the overhaul of the six plants as follows

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 downtime of any of the six plant costs RS.4000 per day for a plant, idle time for Crew A costs rs.1250 per day, and idle time for crew B costs Rs.2150 per day, which of the two schedules, the present one and the one determine in (a) will be more economical? What are their respective costs?

OR

Q-1 Given the following data: (14)
Processing Time (in Hours)

Job	1	2	3	4	5	6
Machine A	12	10	9	14	7	9
Machine B	7	6	6	5	4	4
Machine C	6	5	6	4	2	4

- (a) Order of processing job: ACB
- (b) Sequence suggested: jobs 5,3,6,2,1,4
 - (i) Determine the total elapsed time for the sequence suggested.
 - (ii) Is the given sequence optimal?
 - (iii) If you answer to (ii) is no determine the optimal sequence and the total elapsed time associated with it.

Q-2 (a) What is replacement? Describe some important replacement situations and policies. (07)

Q-2 (b) What are three strategies of replacement of items which follow sudden failure mechanisms? (07)
Explain with examples.

OR

Q-2 Machine A cost of Rs. 80000. Annual operating costs are Rs.2000 for first year, and they increase by Rs.15000 every year Determine the least age at which to replace machine. If optimal replacement policy is followed what will be the average yearly cost of operating and owning the machine? (14)

(a) Another machine B costs Rs.100000. Annual operating cost for the first year is Rs.4000 and they increase by a Rs.7000 every year. The firm has machine of type A which is one-year-old. Should the firm replace it with B and if so, when?

(b) Suppose the firm is just ready to replace the machine A with another machine of same type, just then the firm gets information that the machine B will become available in a year. What should the firm do?

Q-3 (a) What is network analysis? When it is used? What is meant by phase Critical Path? (07)

Q-3 (b) A small project consisting of eight activities has the following characteristics (07)

Time estimates (in weeks)				
Activity	Preceding Activity	Optimistic Time	Most Likely Time	Pessimistic Time
A	-	2	4	12
B	-	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B,C	9	9	9
G	D	3	3.5	7
H	E,F,G	5	5	5

- Draw the PERT network for the subject
- Prepare the activity schedule for the project
- Determine the critical path
- If a 30 week deadline is imposed, what is the probability that the project will be finished within the time limit?

OR

Q-3 A project has the following characteristics: (14)

Activity	Preceding Activity	Duration
A	NONE	5
B	A	2
C	A	6
D	B	12
E	D	10
F	D	9
G	D	5
H	B	9
I	C,E	1
J	G	2
K	F,I,J	3
L	K	9
M	H,G	7
N	M	8

- (i) Draw a pert network for this project.
- (ii) Find the various paths and the critical path as well as the project completion time
- (iii) Prepare an activity schedule showing the EST, EFT, LST, LFT and float for each activity.
- (iv) Will the critical path change if activity G takes 10 weeks instead of 5 weeks? If so, what will be the new critical path?

Q-4 (a) Define inventory, what are the different types of inventory in industries? (07)

Q-4 (b) What is economics order quantity? Discuss step by step the development of EOQ formula (07)

OR

Q-4 (a) What is inventory Management? Briefly explain the major decisions concerning inventory (07)

Q-4 (b) Two items has following characteristics: (07)

Item	Annual Demand	Unit price	Order cost	Holding cost
X	9 units	Rs. 0.25	Rs. 08.00	25%
Y	27 units	Rs. 3.00	Rs. 18.00	25%

- (i) For each item, compute the annual ordering cost, the annual holding cost, and the annual total variable cost for order quantities of 24,36,48,60 units.

- (ii) Compute E.O.Q. for each item and verify the computation by computing total variable costs for one unit more than EOQ and less than one unit EOQ

Q-5 (a) What is Game theory? Discuss its importance to business decisions. (07)

Q-5 (b) Solve the Game (07)

B				
A	35	35	25	5
	30	20	15	0
	40	50	0	10
	55	60	10	15

OR

Q-5 (a) Solve the game by Graphic Method (07)

B		
A	-6	7
	4	-5
	-1	-2
	-2	5
	7	-6

Q-5 (b) Player A is paid Rs.8.00 if two coins turn both heads and Rs.10.00 if two coins turn both tails. Player B is paid 3.00 when the two coins do not match. Given the choice of being A or B, which one would you choose and what would be your strategy? (07)
