

B.B.A. Semester - 6 (CBCS) Examination**April/May-2022 (NEW COURSE)****Statistics Group - Advanced Operations Research Techniques (Elective (New))****Time: 2:30 Hours****Marks: 70****Instructions:**

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

- Que-1 (a) Give difference between PERT and CPM . (07)
 (b) Briefly mention the area of application of network technique. (07)

OR

- Que-1 A small assembly plant assembles PC s through 9 interlinked stages according to adjoining process: (14)

Stage	1-2	1-3	1-4	2-5	3-6	3-7	4-6	5-8	6-9	7-8	8-9
Duration	2	2	1	4	8	5	3	1	5	4	3

- (i) Draw an arrow diagram
 (ii) Tabulate EST, EFT, LST and LFT for all the stages.
 (iii) Find the critical path and assembly duration
 (iv) Tabulate total float, free float and independent float.
- Que-2 (a) What is replacing problem? Describe some important situations of replacement. (07)
 (b) Why does problem of replacement arise? (07)

OR

- Que-2 The cost of a new machine is Rs. 5,000. The maintenance cost during the nth year is given by $R_n = 500(n-1)$, $n = 1, 2, 3, \dots$ suppose that the discount rate per year is 0.05 After how many years it will be economical to replace the machine by a new one? (14)

- Que-3 (a) what is Sequencing Problem? (07)
 (b) Explain 3 machines n – jobs method in terms of sequencing problem. (07)

OR

- Que-3 A refrigeration company has six plants located in different parts of a city. (14)
 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 workmen 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 is 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 optimal sequence.
 (b) If down time of any of the six plants costs Rs.4,000 per day for a plant, idle time for crew A Costs Rs. 1,250 per day and idle time for crew b costs Rs.2,150 per day, which of the two schedule the present one and the one determine in (a) will be more economical? What are their respective costs?
- Que-4 (a) What is dynamic programming problem? (07)
 (b) What different terms are often talked about in context of dynamic programming? Explain the meaning of such terms clearly. (07)

OR

- Que-4 A manager of a certain company, based in city 12, is in city 1 to attend a series of business seminars. on his return he wants to reach city 12 adopting the least cost route between city 1 and city 12. The cost from moving between cities is given below. Find least cost. (14)

From				To city		(figures are in '00' Rs.)					
	2	3	4	5	6	7	8	9	10	11	12
1	5	3	6								
2				4	3	7	7				
3				5	5	3	4				
4				7	4	6	3				
5								7	6	9	
6								6	7	6	
7								8	9	6	
8								8	10	8	
9											9
10											12
11											8

Que-5 (a) Explain two persons zero sum game. (07)

(b) Explain dominance rule. (07)

OR

Que-5 (a) Solve the game. (07)

B

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

(b) Solve the game. (07)

B

	1	5	-7	-4	2
A	2	6	9	-3	1
