

B.B.A. Semester - 6 (CBCS) Examination
March/April-2025 (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) Explain (07)
- 1) Marge event
 - 2) Burst event
 - 3) Dummy activity

OR

- Que-1 A small project consisting of eight activities has the following characteristics. (14)

Time-Estimates (In Weeks)

Activity		Preceding Activity	a	m	b
A		None	2	4	12
B		None	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

a = optimistic, m = most likely time, b = pessimistic time

- 1) Draw the PERT network for the project.
 - 2) Prepare the activity schedule for the project.
 - 3) Determine the critical path.
 - 4) If a 30-week deadline is imposed, what is the probability that the project will be finished within the time limit?
 - 5) If the project manager wants to be 99% sure that the project is completed on the schedule date, how many weeks before that date should he start the project work?
- Que-2 (A) What is replacement? (07)
- (B) Explain different situation of replacement. (07)
- OR
- Que-2 A Manufacturer is offered two machines A and B. A is priced at Rs.5,000 and running costs are estimated at Rs.800 for each of the first five years, increasing by Rs.200 per year in the 6th and subsequent years. Machine B. Which has the same capacity as A costs Rs.2500 but will have running costs of Rs.1200 per year for six years increasing by Rs.200 per year thereafter. If money is worth 10% per year, which machine should be purchased? (14)
- Que-3 (A) What is sequencing problem? (07)
- (B) Explain 2 machines n jobs process. (07)

OR

- Que-3 We have five jobs, each of which must go through three machines A, B and C in the order ABC. Processing times (in hours) are as given below: (14)

Job	1	2	3	4	5
A _i	16	20	12	14	22
B _i	10	12	4	6	8
C _i	8	18	16	12	10

Determine a sequence for the five jobs that will minimize the total elapsed time. Find also the idle time of the machines A, B and C.

- 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 maximum billing route between city 1 and city 12. The cost from moving between cities is given below. Find maximum billing. (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

OR

- Que-4 (A) What are the applications of dynamic programming? (07)
(B) What is dynamic problem? (07)

- Que-5 (A) Explain (07)
1) saddle point
2) two person zero sum game
(B) What is game theory? (07)

OR

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

		B		
		-2	1	2
A		5	-2	-3

- (B) Player A is paid ₹. 16.00 if two coins turn both heads and ₹. 20.00 if two coins turn both tails. (07)
Player B is paid ₹. 6.00 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?
