



RAF-161100010610 Seat No. _____

B. B. A. (Sem. VI) (CBCS) (W.E.F. 2016) Examination
March - 2019

Statistics GRP : Advanced Operations
Research Techniques
(New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions :

- (1) Attempt all five questions.
- (2) Each question carries equal marks.
- (3) Figures to the right indicate marks.

- 1 (a) Give the assumptions made in sequencing problem. 7
- (b) Discuss the algorithm for processing n jobs through two machines. 7

OR

- 1 Determine the optimal sequence of jobs that minimizes the total elapsed time based on the following information. The processing time on machine is given in hours and passing is not allowed. Also calculate idle time on each machine. 14

	Job	J ₁	J ₂	J ₃	J ₄	J ₅	J ₆	J ₇
Machine	A	5	7	3	4	6	7	12
	B	2	6	7	5	9	5	8
	C	10	12	11	13	12	10	11

- 2 (a) What is replacement problem ? Describe important replacement situations and policies. 7
- (b) Explain various types of failures. 7

OR

- 2 The data on the running costs per year and resale price of equipment A whose purchase price is Rs. 20,000 are as follows : 14

Year :	1	2	3	4	5	6	7
Running Cost (Rs.) :	3000	3800	4600	5800	7200	9000	11000
Resale Value (Rs.) :	10000	5000	2500	1200	800	800	800

- (a) What is the optimum period of replacement ?
 (b) When equipment A is two years old, equipment B which is a new model for the same usage is available. The optimum period for replacement is 4 years with an average cost of Rs. 7,200. Should equipment A be changed with equipment B ? If so, when ?

- 3 Explain : 14
- (1) Saddle Point
 - (2) Dominance Rule
 - (3) Two person zero sum game
 - (4) Pure strategies and mixed strategies.

OR

- 3 Solve the following game and find best optimal strategies for both the players and value of the game. 14

		Player B			
		B ₁	B ₂	B ₃	B ₄
Player A	A ₁	2	-2	4	1
	A ₂	6	1	12	3
	A ₃	-3	2	0	6
	A ₄	2	-3	7	1

- 4 (a) What are different types of inventories ? Explain. 7
 (b) Explain different costs associated with an inventory. 7

OR

- 4 For a supplier the annual demand of an item is 10000 units. The inventory holding cost is 30 paise per unit per unit time and set up cost is Rs. 100 per order. Determine the economic lot size and minimum inventory cost. Also determine as to when and how much should be ordered so that total inventory cost is minimum. 14

- 5 (a) Explain : 7
- (1) Total float
 - (2) Free float
 - (3) Independent float

- (b) Write note on PERT. 7

OR

- 5 A project has the following activities and other characteristics. 14

Activity	Preceding Activity	Time Estimates (Days)		
		T _o	T _m	T _p
A	-	4	6	8
B	A	5	7	15
C	A	4	8	12
D	B	15	20	25
E	B	10	18	26
F	C	8	9	16
G	E	4	8	12
H	D,F	1	2	3
I	G,H	6	7	8

- (1) Draw the PERT network diagram.
- (2) Identify the critical path.
- (3) Determine the mean project completion time.
- (4) Find the Prob. that the project is completed in 55 days.
- (5) Within how many days would you expect the project to be completed with 90% chance ?