

(For candidates admitted from 2016–2021 Batch)

B.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Part III — Hospital Administration — Major

OPERATION RESEARCH FOR HOSPITAL
ADMINISTRATION

Time : Three hours

Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$)

Answer ALL the questions.

1. Define operation research.
2. Different phases of operation research.
3. Define PERT.
4. Game theory.
5. Define Simplex method.
6. Big M Method.
7. Assignment Model.
8. Define simulation.
9. Classify operation research Models.
10. Define free slack.

SECTION B — ($5 \times 5 = 25$)

Answer ALL the questions, Choosing either (a) or (b)

11. (a) What are the problems in operation Research.

Or

- (b) Write a short note of properties of good model.

12. (a) Write a note on formulation of Dual.

Or

- (b) An animal feed company must produce 200kg of a mixture consisting of ingredients X_1 and X_2 daily. X_1 costs Rs.3/- per kg and X_2 Rs.8/- per kg. No more than 80 kg of X_1 can be used and at least 60 kg of X_2 must be used. Formulate a linear programming model to minimize the cost.

13. (a) Write a short note on North West corner Rule.

Or

- (b) Write a short note least cost method.

14. (a) Detail note on optimality test.

Or

- (b) In a Bank , every 15 minutes one customer arrives for cashing the cheque. The stuff in the any payment counter takes 10 minutes for serving a customer on an average. State suitable Assumption and find.

(i) The averages Queue length.

(ii) Increase in the arrival rate in

order to Justify for second counter (When the waiting Time of a customer is atleast 15 minutes the Management will increase one more counter)

15. (a) Write a short note on queueing theory.

Or

- (b) An investor was considering stock purchases in two companies. He determined the following pay-off table contingent upon whether company A or B wins on competition for share of the market.

State	Strategies	
	a_1 (Invest in A)	a_2 (invest in B)
θ_1 : A wins out	30	0
θ_2 : B wins out	40	80

(i) What is the maximin strategy? The maximax strategy?

(ii) At what probability of A's winning out is the expected value of the two strategies the same?

SECTION C — ($3 \times 10 = 30$)

Answer any THREE questions.

16. Write a note on critical path.
 17. Detail not on resource scheduling network.
 18. Write a note on linear programming.
 19. The following table gives the activities of a construction project and duration.

Activity	1-2	1-3	2-3	2-4	3-4	4-5
Duration (days)	20	25	10	12	6	10

- (a) Draw the network for the project.
 (b) Find the critical path.
 (c) Find the total, free and independent floats for each activity.
20. A small plant makes two types of automobile parts A and part B. It buys casting that are machined. Bored and polished. you are given the following data:

Capacity	Part A	Part B
Machining capacity	25/hr	40/hr
Boring capacity	28/hr	35/hr
Polishing capacity	35/hr	25/hr

Castings for part. A costs of Rs.20 each and for part-B they cost Rs.30 each. They sell for Rs.50 and Rs.60 respectively. The three machines have running costs of Rs.200 Rs.140 and Rs.175 per hour. Assuming that any combination of part A and part-B can be sold. formulate a linear programming model.