

19001147



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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, APRIL 2019

Fourth Semester

Faculty of Science

Branch I (A) : Mathematics

MT 04 E07—OPERATIONS RESEARCH

(2012 Admission onwards)

Time : Three Hours

Maximum Weight : 30

Part A

*Answer any **five** questions.
Each question has weight 1.*

1. Define back order and lost sale in an inventory model.
2. Define lead time and set up cost.
3. Define Forgetfulness property. Name the only distribution with the property.
4. Define queue discipline and give some most common discipline.
5. Define Backward recursion in a D.P.P. When it is convenient.
6. Define monotonic non increasing and monotonic non decreasing functions.
7. Define continuous and discrete simulation models.
8. What are the basic terms used in sequencing ?

(5 × 1 = 5)

Part B

*Answer any **five** questions.
Each question has weight 2.*

9. An item is produced at the rate of 50 items a day. The demand occur at the rate of 25 items per day if the set up cost is Rs. 100/run and holding cost is R 0.01 unit time /day. Find the production lot size for 1 run assuming that the shortages are not permitted. Also find the time of the cycle.
10. A manufactures has to supply 24000 units of production per year to his customers. The demand is fixed and known. If the manufacturer fails to supply then the penalty is 0.2 per unit per month. The inventory holding cost is R 0.1 per unit per month and set up cost is Rs.350/production run. Find the optimum lot size for the manufacturer.

Turn over





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11. How to solve single additive constraint, Multiplicatively separable return type optimization problem using D.P.P.
12. Determine (U_1, U_2, U_3) subject to $U_1 + U_2 + U_3 = 5$, $U_1, U_2, U_3 \geq 0$.
13. The manager of a new fast food restaurant wants to quantify the arrival process of customers by estimating the probability of inter arrival time interval that will less than 2minutes. Arrival in similar restaurant occur at the rate of 35 customers/hr. The inter arrival time is exponentially distributed.
14. A cafeteria can seat a maximum of 50 person. Customers arrive in a poisson stream at the rate of 10 per hr. They are serviced at the rate of 12 per hr. For simplicity assume that customers are served one at a time by on water. What is the probability that the next customer will not eat in the cafeteria because it is full.
15. Define Inverse and acceptance rejection method.
16. Explain the assumption underlying a sequencing problem.

(5 × 2 = 10)

Part C

*Answer any **three** questions.*

Each question has weight 5.

17. Explain news paper boy problem to find the optimal inventory.
18. (a) The controller has to supply 10,000 bearings/day to automobile manufacturer. He finds that when he starts a production run he can produce 25,000 bearings/day. The cost of holding a bearing in stock for 1 year is 2 paise and the set up cost of production run is Rs. 18. How frequently should the production be made.
(b) A contractor has to supply 20,000 units of an item/day. He can produce it 30,000 units. The cost of holding a unit in stock is Rs. 3 per year and the set up cost 1 run is Rs. 50. How frequently and of what size the production be made.
19. Derive and define formals for steady state performance measures.
20. Explain and find the performance measures of $(M/M/C) : (GD/N/\infty), C < N$.
21. In a serial two stage optimization problem the objective function is separable and monatomic non-decreasing. The show that the problem is decomposable.
22. Let 'n' jobs are processed on two machines M_1 and M_2 in a sequencing order. Find an equal on for the idle time of M_2 by drawing granti chart.

(3 × 5 = 15)

