

CODE: 196142
NOVEMBER 2020

TIME: 2Hrs
MAX. MARKS : 50

PART A
Answer any TEN questions

(10 x 2=20)

1. What do you mean by dummy activity?
2. Define critical path.
3. Define Inventory
4. Define lead time, reorder level.
5. Explain Kendal's notation for representing Queueing system
6. Write down Little's formula.
7. What is 2-person zero sum game?
8. Define saddle point.
9. What is no passing rule in a sequencing problem?
10. What is a sequencing problem?
11. Define independent float.
12. When a game is said to be strictly determinable?

PART B
Answer any TWO questions

(2 x 5=10)

13. Compute the earliest start, earliest finish latest start, and latest finish time of each activity of the project given below

Activity	1-2	1-3	2-4	2-5	3-4	4-5
Durartion (In days)	8	4	10	2	5	3

14. Discuss all the costs involved in inventory problems.
15. Derive the probability law for 'n' customers in the system (ie, P_n) for $(M|M|1):(\infty | \text{FIFO})$ model.
16. For what value of λ , the game with the following payoff is strictly determinable.

Player B

$B_1 \quad B_2 \quad B_3$

$$\text{Player A} \begin{pmatrix} A_1 & \lambda & 6 & 2 \\ A_2 & -1 & \lambda & -7 \\ A_3 & -2 & 4 & \lambda \end{pmatrix}$$

17. There are five jobs, each of which is to be processed through two machines M_1, M_2 in the order $M_1 M_2$. Processing hours are as follows:

Job	1	2	3	4	5
M_1	3	8	5	7	4
M_2	4	10	6	5	8

Determine the optimum sequence for the five jobs, and minimum total elapsed time. Find also the idle time of machines M_1 and M_2 .

18. A T.V repairman finds that the time spent on his job has been an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they came in and if the arrival of sets is poisson with an average rate of 10 per 8 hour day, what is his expected idle time day? How many jobs are ahead of the average set just brought in?

19. Solve the following 2×2 games.

$$A \begin{pmatrix} B \\ \begin{pmatrix} 2 & 5 \\ 7 & 3 \end{pmatrix} \end{pmatrix}$$

20. Explain Total float, Free float and Independent float with examples.

PART C

(2x10=20)

Answer any TWO questions

1. 21. The following table indicates the details of a project. The duration in days

Activity	1-2	1-3	1-4	2-4	2-5	3-5	4-5
Optimistic Time (a)	2	3	4	8	6	2	2
Most likely time (m)	4	4	5	9	8	3	5
Pessimistic time (b)	5	6	6	11	12	4	7

1) Draw the network

2) Find the critical path

3) Determine the expected standard deviation of the completion time.

22. A manufacturing company purchases 9000 parts of a machine for its annual requirements, ordering one month usage at a time. Each part costs Rs.20. The ordering cost per order is Rs.15 and the carrying charges are 15% of the average inventory per year. You have been asked to suggest a more economical purchasing policy for the company. What advice would you offer, and how much would it save the company per year?

23. A bank has two tellers working on savings accounts. The first teller handles withdrawals only. The second teller handles deposits only. It has been found that the service time distribution for the deposits and withdrawals both are exponential with mean service time 3 minutes per customer. Depositors are found to arrive in a poisson fashion throughout the day with mean arrival rate 16 per hour. Withdrawers also arrive in a Poisson fashion with mean arrival rate 14 per hour. (i) What would be the effect on the average waiting time for depositors and withdrawers if each teller could handle both withdrawals and deposits? (i) What would be the effect if this could be accomplished by increasing service time to 3.5 minutes?

24. Using dominance property solve the following game and solve it graphically.

Player B

$$A \begin{pmatrix} B_1 & B_2 & B_3 & B_4 \\ \begin{pmatrix} 18 & 4 & 6 & 4 \\ 6 & 2 & 13 & 7 \\ 11 & 5 & 17 & 3 \\ 7 & 6 & 12 & 2 \end{pmatrix} \end{pmatrix}$$

25. Solve the following sequencing problem giving as optimal solution if passing is not allowed.

Machines

	M ₁	M ₂	M ₃	M ₄
A	13	8	7	14
B	12	6	8	19
C	9	7	8	15
D	8	5	6	15

Jobs

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