K25P 3515

Reg. No. : .....

Name : .....

I Semester M.Com. Degree (CBCSS – OBE – Reg./Supple./Imp.) Examination, October 2025
(2023 Admission Onwards)
CMCOM01C02 : QUANTITATIVE TECHNIQUES AND OPERATIONS RESEARCH

Time : 3 Hours Max. Marks : 60

SECTION – A

Answer **any five** questions in this Section. **Each** carries **3** marks.

1. Mention the essential characteristics of Operations Research.
2. The marks of students in an exam are normally distributed with a mean = 70 and a standard deviation = 10. Find the probability that a student scores above 80.
3. From a standard deck, one card is drawn. You are told the card is a face card (J, Q, K). What is the probability that it is a king ?
4. Define the terms "Slack" and "Float" in project management.
5. Two coins are tossed. Find the probability of getting two heads, given that at least one head appears.
6. What is "Queuing Theory" ? Mention its basic components. **(5×3=15)**

SECTION – B

Answer **any three** questions in this Section. **Each** carries **5** marks.

7. Differentiate between CPM and PERT.
8. How game theory applied in business decision making ?
9. Find the probability that a student studies Mathematics or Science under the following conditions in a class :
   i) Probability that a student studies Mathematics (A) = 0.6,
   ii) Probability that a student studies Science (B) = 0.5, and
   iii) Probability that a student studies both ($A \cap B$) = 0.3.

P.T.O.

10. A student guesses on 5 True/False questions. Find the probability that he answers exactly 4 correctly.

11. In 200 bulbs, the probability of a bulb being defective is 0.1. Find the mean and standard deviation. **(3×5=15)**

SECTION – C

Answer **any three** questions in this Section. **Each** carries **10** marks.

12. Draw a network diagram and find the critical path and total project duration for :

Activity	Predecessor	Duration
A	–	5
B	A	6
C	A	4
D	B and C	7

13. Solve the following Transportation Problem using the North-West Corner Method :

Source	D_1	D_2	D_3	Supply
S_1	4	8	8	100
S_2	16	24	16	150
S_3	8	16	24	250
Demand	200	100	200	

14. Define "Operations Research". Detail its importance and phases.

15. "LPP is a powerful tool for optimisation, but its assumptions limit its practical use in complex real-world situations." Critically evaluate.

16. A factory produces electric bulbs, and on average, 2 bulbs out of every 100 are found to be defective. If a random sample of 100 bulbs is tested, find the probability that there are
    i) no defective bulbs
    ii) exactly 1 defective bulb, and
    iii) at least one defective bulb.
    Use the Poisson distribution to solve this case. **(3×10=30)**