

B.Sc. Sem.-5 Examination

SE-305

Statistics (Business Stat.)

Time : 2-30 Hours]

April-2025

[Max. Marks : 70

- Q.1(A) What is Markov-Chain? Explain the Markov-chain with two illustrations. 09
- (B) Define and prove the Chapman Kolmogorov equation for discrete Markov-chain. 09

OR

- (A) What is the transition probability matrix? Explain with illustration. 09
- (B) Write an application of Markov-chain. 09
- Q.2 (A) What is decision theory? Explain methods of decision making under uncertainty? 09
- (B) Short note on Decision-Tree? 09

OR

- (A) Determine the best act for the following pay-off matrix by using: (I) Maxi-max rule 09
(II) Maxi-mini rule (III) Mini-Max rule (IV) Laplace rule (V) Hurwitz rule ($\alpha = 0.5$).

Acts	State of nature			
	S1	S2	S3	S4
A1	12	2	2	2
A2	8	3	-5	3
A3	3	8	3	4
A4	5	4	-6	5

- (B) What is decision theory? Explain methods of decision making under risk? 09
- Q.3 (A) What is simulation? explain the different type of simulation. 09
- (B) A tourist car operator finds that during the past few months, the buses used has varied so much the cost of maintaining the buses varied considerably. During the past 200 days demand for the cars calculate as below. 09

Demand per week	0	1	2	3	4	5
Frequency	44	23	40	62	56	45

Simulate the demand for the 10 weeks period. Use the random nos. 80, 90, 20, 56, 45, 84, 60, 15, 58, and 13.

OR

- (A) State the different step involves in simulation. 09

(P.T.O)

- (B) A Hero bike production line turns out about 100 bike per day but deviation occur owing to many causes. The production is more accurately describe by the probability distribution given below. 09

Production per day	70	102	65	55	104	80	50	105	78	82	103
Probability	0.03	0.05	0.07	0.10	0.15	0.20	0.15	0.08	0.08	0.06	0.04

Finished bike are transport across the bay at the end of each day by ferry. If ferry has space for only 101 bikes. Then what will be average no. of bike waiting to be ship and what will be average no. of empty on the ship. use the random no: 94, 22, 08, 60, 86, 52, 15, 34, 15, 45, 14, 90, 20, 30, 50.

- Q.4 Answer any **eight (08)** from following: 16

1. State the roll of simulation in management of space technology.
2. Write the application of simulation.
3. How many phases involve in simulation technique?
4. What is role of EVPI in decision theory.
5. What is EOL?
6. Define Pay-off in decision theory.
7. Define Inadmissible event.
8. What is Stochastic process.
9. Define: Hurwitz method
10. Give me full name of EPPI.
