0212 N906

Candidate's Seat No : _____

B.Sc Sem.-5 Examination
SE 305
Statistics (Business Stat)
December-2024

Time : 2-30 Hours]

[Max. Marks : 70

Instructions:
1. All questions are compulsory and carry equal marks.
2. Figures to the right indicate full marks of the questions/sub-questions

Q. 1	a	Describe in detail, Markov chain. Give its applications.	09
	b	In usual notations, State and prove the Chapman Kolmogorov equation for discrete markov chain.	09

OR

	a	Define different states of markov chains with appropriate examples, used in markov chain.	09
	b	Define: Transition probability and Transition probability matrix For the following transition matrices, find 2-step transition probability	09

0.7	0.3
0.2	0.8

0.5	0	0.5
0	1	0
0	0.3	0.7

Q. 2	a	Define term: Decision Theory, strategies, events, decision under risk, payoff matrix. State applications of decision theory.	09
	b	State different principles used in decision theory. Explain Laplace criterion with illustration	09

OR

	a	Describe pessimistic Criterion with illustration.	09
	b	For the following pay-off matrix, determine the most suitable strategy using	09

1) Maximax 2) Minimax 3) Hurwicz 4) Laplace principles
(*Use* $\alpha = 0.35$ *for Hurwicz Principle*)

Events	Strategy			
	A1	A2	A3	A4
E1	20	16	13	8
E2	15	8	14	18
E3	7	17	9	16

Q. 3	a	What is simulation? Write a brief note on deterministic model giving one illustration. simulation process.	09
	b	State *simulation* method of generating random numbers.	09

OR

	a	Explain stochastic simulation models, citing one example.	09
	b	Give reasons for using simulation in real life situations	09

(P.T.o)

Q. 4   **Answer ANY EIGHT (08) from following**   **16**
1   Give one application of Markov Chain.
2   Define 2 step transition probability.
3   Define Steady State giving one example.
4   What does a coefficient α in Hurwicz Principal indicate?
5   Give another name for pessimistic principal.
6   When optimization techniques fail to solve a problem, simulation is a better
        approach. Give Reason.
7   What is the role of E. V. P. I in decision theory?
8   State the role of simulation technique in Inventory management.
9   What is Stochastic process?
10   What is the use of E. M. V? State its importance.

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