END SEMESTER EXAMINATION – APRIL 2025
MANAGEMENT – I SEMESTER MBA
24MBA14 – STATISTICS FOR MANAGEMENT

Time: 3 Hours **Max. Marks: 70**

Instruction: *Answer should be written completely in English*

SECTION - A

Answer any FIVE questions. Each question carries FIVE marks. (5x5=25)

1. Averages are useful in business metrics. Justify this statement.
2. Urn-1 contains 5 red and 5 black balls, Urn-2 contains 4 red and 8 black balls and Urn-3 contains 3 red and 6 black balls. One Urn is chosen at random and a ball is drawn. The colour of the ball is black. What is the probability that it has been drawn from Urn-3?
3. Metro passengers arrive randomly and independently at the passenger-screening facility at a metro station. The mean arrival rate is 8 passengers per minute. Compute the following:
    a) Probability of no arrivals in a 1-minute period.
    b) Probability that three or fewer passengers arrive in a 1-minute period.
    c) Probability of no arrivals in a 15-second period.
    d) Probability of at least one arrival in a 15-second period.
4. What is sampling? Explain the different methods of sampling.
5. Prove that the Fischer's Ideal Index satisfies the Factor Reversal Test and the Time Reversal Test using the following data:

P_0	P_1	Q_0	Q_1
12	14	10	11
13	15	11	13
10	11	12	14
9	12	10	12
8	10	9	10
12	14	8	11

6. Using the Chi-square test for the following data, determine whether the medicine administered to prevent a certain disease in poultry has been useful or not. You may use a 5% level of significance.

Details	Poultry that fell ill	Poultry that did not fall ill
Poultry administered medicine	234	256
Poultry not administered medicine	345	365

7. Write down the steps in the construction of Decision Tree Analysis and illustrate with a flowchart.

SECTION - B

Answer any THREE questions. Each question carries TEN marks. (3x10=30)

8. If the height of 800 students is normally distributed with a mean of 68 inches and a standard deviation of 2 inches, then find how many students have heights:
   (a) Greater than 73 inches?
   (b) Less than or equal to 66 inches?
   (c) Between 65 and 69 inches, both inclusive?
   (d) Equal to 71 inches?
   (e) Between 64 and 70 inches, both inclusive?

9. Mr. A has two options for investment but can take up only one at a time.

   Option A: He can start a restaurant for Rs.9,00,000. The probability of success is 75% with a cash inflow of Rs. 12,00,000. If he fails, he can still salvage Rs.6,00,000. When he succeeds, he can start a fast food shop for Rs.4,00,000/- wherein he can get success, with a 80% probability and cash inflow of Rs.3,00,000/-. If he fails, he incurs a loss of Rs.50,000.

   Option B: He can start a car showroom for Rs.8,00,000. The probability of success is 90% with a cash inflow of Rs. 9,00,000. If he fails, he can salvage Rs.5,00,000.

   Construct a decision tree and payoff chart. Show the best decision that Mr. A should take.

10. A study was carried out on the advertising methods of a brand of product. The unit sales achieved by five stores were recorded as follows:

Store	Store A	Store B	Store C	Store D	Store E
Method I	82	88	79	81	92
Method II	77	83	81	78	80
Method III	71	79	90	83	90

   Calculate the F-ratio using ANOVA and a 15% level of significance. Establish whether there is a significant difference between the sales in the different stores.

11. By means of the coefficient of variation, determine which of the following judges has been more consistent in awarding marks:

Subjects	I	II	III	IV	V
Judge A	15	20	70	80	25
Judge B	40	50	30	45	65

SECTION - C

Compulsory question (Case study). The question carries FIFTEEN marks.   **(1x15=15)**

12. The following data relates to the price and demand of a commodity for ten years. Calculate the coefficient of correlation between the two series, and explain its significance with the probable error. Also, calculate the two regression equations and explain how much the price fluctuates with the supply for different values.

Price (Rs.): 12, 14, 15, 16, 18, 20, 22, 24, 25, 27

Demand (Units): 30, 32, 34, 36, 38, 40, 42, 44, 46, 48.

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