

# END SEMESTER EXAMINATION

## Statistics for Business Decisions: MTSB0091

**Total Marks: 100**

**Duration: 3 hrs**

1. Choose the appropriate answer: [1X10=10]
- i. In a survey, customers are asked to provide their gender: male or female. Indicate the type of data described [CO1]
- a) Continuous
  - b) Ordinal
  - c) Nominal
  - d) None of these
- ii. Calculate the median of the following set of data: 123, 243, 322, 492, 537, 599, 620, 798, 812, 954. [CO1]
- a) 537
  - b) 568
  - c) 550
  - d) 598
- iii. If you have a data set that consists of the following three values 1, 2, and 3, which of the following statements are true: [CO1]
- a) The range of the data is 3.
  - b) The sample standard deviation equals the sample average.
  - c) The sample standard deviation equals the sample variance.
  - d) both 1 and 2
- iv. The mean deviation about median from the data: 340, 150, 210, 240, 300, 310, 320 is: [CO1]
- a) 51.6
  - b) 51.8
  - c) 52
  - d) 52.8
- v. A box contains 6 red balls, 7 green balls and 5 blue balls. Each ball is of different size. The probability that the red ball selected is the smallest red ball is [CO2]
- a)  $\frac{1}{8}$
  - b)  $\frac{1}{3}$
  - c)  $\frac{1}{6}$
  - d)  $\frac{2}{3}$

- vi. A card is drawn from a well shuffled pack of playing cards. Find the probability that it is either a diamond or a king [CO2]
- 1/6
  - 1/3
  - 17/52
  - 16/13
- vii. If there is a very strong correlation between two variables then the correlation coefficient must be [CO3]
- any value larger than 1
  - much smaller than 0, if the correlation is negative
  - much larger than 0, regardless of whether the correlation is negative or positive
  - None of these alternatives is correct.
- viii. The coefficient of correlation [CO3]
- is the square of the coefficient of determination
  - is the square root of the coefficient of determination
  - is the same as r-square
  - can never be negative
- ix. Multiplicative model of time series is ... [CO3]
- $Y=T*S*C*I$
  - $Y=T+S+C+I$
  - $Y=T-S-C-I$
  - $Y=T*S*C$
- x. In semi average method if the values are odd then we drop [CO3]
- first value
  - last value
  - middle value
  - last two values

2. Answer any five of the following questions: [3X5=15]

- i. A petrol station owner records the number of cars which visit his premises on 10 days. The numbers are: 204, 310, 279, 314, 257, 302, 232, 261, 308, and 217. The owner hopes that the mean will increase if he includes the number of cars on the next day. If 252 cars use the petrol station on the next day, will the mean increase or decrease? [CO1]

- ii. Average daily wage of 50 workers of a factory was Rs 200 with a standard deviation of Rs 40. Each worker is given a raise of Rs 20. What is the new average daily wage and standard deviation? Have the wages become more or less uniform? [CO1]
- iii. For a distribution Karl Pearson's coefficient of skewness is 0.64, SD is 13 and mean is 59.2. Find the median and mode [CO2]
- iv. A family has two children. What is the probability that both the children are boys given that at least one of them is a boy? [CO2]
- v. Explain the properties of conditional probability. [CO2]
- vi. Differentiate between Karl Pearson's Coefficient of Correlation and Spearman's Rank Correlation Coefficient. [CO3]

3. Answer any five of the following questions: [7X5=35]

- i. Show that correlation coefficient 'r' is Geometric Mean of regression coefficients. [CO3]
- ii. Calculate range and semi-inter quartile range and its coefficient. [[CO1]

Central size	1	2	3	4	5	6	7	8		10
Frequency	2	9	11	14	20	24	20	16	5	2

- iii. Define Type I error and Type II error, and identify the type of error that researcher's control. [CO4]
- iv. Calculate Karl Pearson's co-efficient of skewness from the following figures - [CO2]

<u>Income</u>	<u>No. of persons</u>
0 & not exceeding 9	75
10 & not exceeding 19	100
20 & not exceeding 29	302
30 & not exceeding 39	603
40 & not exceeding 49	452
50 & not exceeding 59	63
60 & not exceeding 69	25

- v. Explain the multiplication rule of probability. Three cards are drawn successively, without replacement from a pack of 52 well shuffled cards. What is the probability that first two cards are kings and the third card drawn is an ace? [CO2]
- vi. Explain the utility of time series analysis. Explain the various components of fluctuations in time series. [CO3]

4. Answer any four of the following questions:

[10X4=40]

i. Suppose you take out two cards from a standard pack of cards one after another, without replacing the first card. What is probability that the first card is the ace of spades, and the second card is a heart? [CO2]

ii. Given the following data: [CO3]

X	2	4	5	6	8	11
Y	18	12	10	8	7	5

- Fit the regression line of Y on X and estimate Y if X = 10
- Fit the regression line of X on Y and estimate X if Y = 8.5
- Calculate Karl Pearson's coefficient of correlation.
- Interpret the regression coefficients.

iii. Calculate Karl Person's Coefficient of Correlation: [CO3]

Height of Husbands (in inches)	60	62	64	66	68	70	72
Height of Wives (in inches)	61	63	63	63	64	65	62

iv. Explain the procedure of computing a z-score for a sample mean on the sampling distribution of means. [CO4]

v. What is a time series analysis? Explain the term "Secular trend" with example. Calculate the 4-yearly moving average values for the following: [CO3]

Year	Value
1976	24
1977	28
1978	34
1979	42
1980	52
1981	64
1982	78
1983	94
1984	112
1985	132
1986	154
1987	178