

MASTER OF BUSINESS ADMINISTRATION
First Semester
STATISTICAL & QUANTITATIVE METHODS
(MBA- 04)

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

I. Answer any five of the following questions:

10×5=50

1. a) What are the different measures of central tendency? 2+4+4=10
b) Find the Mean and Mode for the following distribution of data:

Class interval	0 -10	10 – 20	20 – 30	30 - 40
Frequency	5	8	3	4

2. What do you understand by 'coefficient of variation'? Discuss its importance in business problems.

Two salesman selling the same product ,show the following results over a long period of time:

	Salesman X	Salesman Y
Average sales volume per month(Rs.)	30,000	35,000
S.D	2,500	3,600

Which salesman seems to be more consistent in the volume of sales? 2+4+4=10

3. a) What is conditional probability? 2+4+4=10
b) If A and B are events with $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{4}$ and $P(A \cup B) = \frac{1}{2}$, find
(i) $P(A/B)$ (ii) $P(B/A)$ (iii) $P(A \cap B)$ (iv) $P(A/B)$
c) A bag contains 10 black and 5 white balls. Two balls are drawn from the bag one after the other without replacement. What is the probability that both the drawn balls are black ?

P.T.O.

4. Define the terms-----

6+4=10

- a) Square Matrix
- b) Transpose of a matrix
- c) Adjoint of a square matrix

Find the determinant, $A = \begin{bmatrix} 1 & 3 & 4 \\ 2 & -3 & 2 \\ 1 & 5 & 6 \end{bmatrix}$

5. a) Differentiate the following function with respect to x

5+5=10

$$Y = xe^x \log_e x$$

b) Use matrix inverse method to solve following system of liner equations.

$$2x - y + 3z = 9$$

$$X + y + z = 6$$

$$X - y + z = 2$$

6. Distinguish between sampling and non- sampling errors. Enumerate the various methods of sampling and describe two of them mentioning the situations where each one is to be used.

4+6=10

7. Define Type I and Type II Errors.

2+8=10

The following figures show the distribution of digits in numbers chosen at random from a telephone directory.

Digits	0	1	2	3	4	5	6	7	8	9	Total
Frequency	1026	1107	997	966	1075	933	1107	972	853	964	10000

Test whether the digits may be taken to occur equally frequency in the directory. (Tabulated chi square for 9 d.f at 5% level of significant is 16.919)

8. Explain the meaning and significance of the term correlation. State some of the important properties of correlation and regression coefficients.

Given below the following information about advertisement expenditure and sales:

	Adv. Exp. (X) (Rs. in crore)	Sales (Y) (Rs. in crore)
Mean	20	120
SD	5	25
Correlation coefficient, $r = 0.8$		

Find the two lines of regression .

3+3+4=10

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Duration: 20 minutes

Marks – 20

(PART A- Objective Type)

I. Choose the correct answer:

1×20=20

1. A rectangular or a square array of numbers arranged systematically into rows and _____ is called a matrix.

2. If $f(x) = x^n$, then derivatives of $f(x)$ is

- a) nx^{x-1} b) x^{n-1} c) x^n d) none

3. A square matrix A is said to be singular if $|A|$, equal to

- a) 0 b) 1 c) -1 d) none of the above

4. The algebraic sum of the deviations from mean is:

- a) maximum b) minimum c) zero d) none of the above

5. If an observation in the data set is zero, then its geometric mean is:

- a) positive b) negative c) zero d) in determinant

6. Which of the following relationship is true in a multimodal distribution?

- a) $\text{Mean} - \text{Mode} = 3(\text{Mean} - \text{Median})$
b) $\text{Mode} = 3\text{Median} - 2\text{Mean}$
c) $3\text{Median} = (2\text{Mean} + \text{Mode})$
d) All of the above

7. Which of the following is a relative measure of dispersion:

- a) Standard deviation
- b) Variance
- c) Coefficient of variation
- d) all of the above

8. Variance is the square of the standard deviation.

- a) True
- b) False

9. For any two statistically independent events, $(A \cap B) = P(A) + P(B)$

- a) True
- b) False

10. The value of probability lies between

- a) 0 to 1
- b) 0 to 2
- c) -1 to 1
- d) none of the above

11. If $P(A \cap B) = 0.20$ and $P(B) = 0.8$, then $P(A/B)$ is,

- a) 0.25
- b) 0.4
- c) 0.5
- d) 0.75

12. The mean of the binomial distribution with n observations and the probability of success p is

- a) pq
- b) np
- c) \sqrt{np}
- d) \sqrt{pq}

13. Normal curve is a bell - shaped curve and is symmetric about its _____.

- a) Mean
- b) S.D
- c) Q.D
- d) none

14. All normal distributions are:

- a) bell-shaped
- b) symmetrical
- c) defined by its parameters μ and σ
- d) all of the above.

15. Which of the following is non-probability sampling?

a) Purposive sampling

c) Cluster sampling

b) Random sampling

d) Stratified sampling

16. If $\mu=30.5$, $n=100$, $\bar{x} = 28.8$ and $\sigma = 8.35$, then $|z| =$

a) 2.5

b) 1.98

c) 2.4

d) 2.68

17. The value of correlation coefficient lies between,

a) -1 to +1

b) 0 to 1

c) -1 to 0

d) None of the above

18. If variables X and Y are independent, then the angle between the two regression lines,

a) 90°

b) 45°

c) 180°

d) None of the above

19. An $m \times n$ matrix is said to be square matrix if

a) $m=n$

b) $m > n$

c) $n > m$

d) None of the above

20. Find ${}^n C_r$, if $n=9$ and $r=3$

a) 84

b) 46

c) 42

d) 40
