

**MASTER OF BUSINESS ADMINISTRATION
FIRST SEMESTER
BUSINESS STATISTICS
MBA – 105**

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

1. and..... are not effected by the extreme values.
a. Median, mode
b. Mean, mode
c. Mean, median
d. None of the above.
2. Which of the following is true for symmetric distribution?
a. Mean $\neq$ median $\neq$ mode
b. Mean $>$ median $>$ mode
c. Mean $<$ median $<$ mode
d. Mean = median = mode
3. The best relative measure of dispersion is:
a. Coefficient of variation
b. Standard deviation
c. Variance
d. None of the above
4. In a certain distribution, mode = 24, median = 25, the mean is:
a. 25
b. 25.5
c. 26
d. 26.5
5. The terms prosperity, recession, depression and recovery are in particular attached to:
a. Secular trend
b. Cyclical variation
c. Seasonal variation
d. Random variation
6. Index numbers reveal the state of:
a. inflation
b. deflation
c. Both a and b
d. None of the above
7. Consumer's price index measures changes in:
a. Retail prices
b. Wholesale prices
c. Producer's prices
d. None of the above.
8. If two regression lines coincide, then the correlation coefficient between the two variables i.e. r is:
a. 0
b. ± 1
c. undetermined
d. N one of the above
9. If the value of a regression coefficient is a negative quantities, the value of the other regression coefficient is:
a. 0
b. positive quantity
c. negative quantity
d. None of the above

10. The correlation coefficient of the two variables X and Y i.e. $r(X,Y) = 0$, then the variables X and Y are:
 - a. Not independent
 - b. independent
 - c. Strongly related
 - d. None of the above
11. For two events A and B, if $P(A \cap B) = 0$, then the events A and B are:
 - a. mutually exclusive
 - b. exhaustive
 - c. independent
 - d. None of the above.
12. If S be a sample space of a random experiment, then $P(S) = \dots\dots\dots$
 - a. In between 0 and 1
 - b. Undetermined
 - c. 1
 - d. 0
13. If the random variable X follows a Poisson distribution with parameter 4, then the variance of X is:
 - a. 4
 - b. 2
 - c. 16
 - d. None of the above.
14. For a random variable $X \sim N(\mu=5, \sigma=2)$, the standard normal variable $Z = \dots\dots\dots$, when $X = 8$.
 - a. 1
 - b. -1.5
 - c. 1.5
 - d. 0
15. Parameter is/are.....
 - a. a constant
 - b. population characteristic
 - c. Both a and b
 - d. sample characteristic.
16. Estimation of the two values of a statistic, in which the true value of a parameter lies, with a certain level of confidence, is called:
 - a. Interval estimation
 - b. Point estimation
 - c. Hypothetical value
 - d. None of the above
17. A good estimator of the true value of a population mean is:
 - a. Sample variance
 - b. Sample mean
 - c. Sample proportion
 - d. None of the above
18. Type I error is:
 - a. Accepting the null hypothesis, when it is not true.
 - b. Accepting the null hypothesis, when it is true.
 - c. Rejecting the null hypothesis, when it is true.
 - d. Rejecting the null hypothesis, when it is not true.
19. If the calculated value of the test statistic is less than its critical value, we
 - a. reject the null hypothesis
 - b. accept the alternative hypothesis
 - c. either a or b
 - d. do not reject the null hypothesis
20. The linear function which is either maximized or minimized with the given constraints, is called:
 - a. Objective function
 - b. Linear function
 - c. Linear constraint
 - d. None of the above

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(Descriptive)

Time : 2 Hr. 30 Mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Calculate mean, median, mode coefficient of variation and coefficient of skewness from the following distribution.

2×5=10

Age (less than in years)	10	20	30	40	50	60
No. of person s died	2	5	10	18	28	37

2. a) Write the applications of inferential statistics in managerial decision making.
b) The following data are about sale and advertising expenditures of a firm:

4+3+3=10

	Sale (in crores of ₹)	Advertising expenditure (in crores of ₹)
Mean	40	6
Standard deviation	10	1.5

Coefficient of correlation $r = 0.9$

- (i) Estimate the likely sale for a proposed advertisement expenditure of ₹ 10 crores.
(ii) What would be the advertisement expenditure if the firm fixes a sale target of 60 crores of rupees.
3. a) Write the importance of index number in business.
b) Show with the help of following data, Fisher's index satisfies the Time Reversal Test and Factor Reversal Test.

4+6=10

Items	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	10	2	20	2
B	8	5	10	4
C	7	5	8	6
D	9	4	9	5

4. a) What is time series? Give examples. Write the usefulness of time series. 1+1+2+6=10

b) Fit a straight line trend to the time series data and predict sales for the year 2019.

c)

Year:	2013	2014	2015	2016	2017	2018
Sales(₹ in thousand):	20	25	46	59	60	45

5. a) Write the Classical and Axiomatic approaches of probability. 2+2+6=10

b) A candidate is applied three posts of management trainee. The chances of selecting the first post is $\frac{1}{3}$, the second post is $\frac{1}{4}$ and the third post is $\frac{1}{2}$. What is the probability that the candidate will be selected at least one of the post?

6. a) Define binomial distribution. State its assumptions. 1+3+6=10

b) Assume the mean height of soldiers to be 68.22 inches with a variance 10.8 sq inches. How many soldiers in a regiment of 1000 would you expect to in between 5 feet and 6 feet. [Given $\Phi(1.15) = 0.3749$ and $\Phi(2.50) = 0.4938$]

7. a) Distinguish between point estimation and interval estimation. 4+1+5=10

b) Let a sample of size 100 and mean 32.5, be drawn from a normal population with unknown mean μ and the known standard deviation $\sigma = 5.8$. What is the point estimation of the true value of the population mean μ ? Find the 95% confidence interval of the population mean μ . [Given, $Z_{0.05} = \pm 1.96$]

8. Solve the LPP by graphical method 10

Maximize $Z = 5x + 6y$

Subject to

$$2x + 3y \leq 18$$

$$2x + y \leq 12$$

$$3x + 3y \leq 21$$

$$x, y \geq 0$$

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