

MASTER OF BUSINESS ADMINISTRATION  
FIRST SEMESTER  
QUANTITATIVE TECHNIQUES IN BUSINESS  
MBA – 105

**SET  
B**

[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

- For an event A, if  $P(A) = \frac{3}{4}$ , then  $P(A^c) =$  \_\_\_\_\_
  - $\frac{1}{4}$
  - $\frac{3}{4}$
  - 12
  - $\frac{1}{3}$
- Let, the random variable X follows a binomial distribution with parameters 9 and  $\frac{2}{3}$  then the standard deviation of X, is \_\_\_\_\_
  - 2.45
  - 1.41
  - 1.73
  - 2
- Which of the following statement is true for a Poisson distribution?
  - Mean < variance
  - Mean > variance
  - Mean ≠ variance
  - Mean = variance
- The mean and standard deviation of a standard normal variate Z are respectively
  - 1 and 0
  - 0 and 1
  - $\mu$  and  $\sigma$
  - None of the above
- If a sample of large size n with known standard deviation, is drawn from a normal population, which of the following test statistic is applied?
  - Z
  - $\chi^2$
  - t
  - F
- The mean of the sampling distribution of the sample means, is
  - the population variance
  - the population mean
  - the population proportion.
  - None of the above
- The corresponding statistic of population variance, is
  - sample variance
  - sample standard deviation
  - sample mean
  - None of the above.
- Which of the following is Type II error?
  - Reject  $H_0$ , when it is not true.
  - Reject  $H_0$ , when it is true.
  - Accept  $H_0$ , when it is true.
  - Accept  $H_0$ , when it is not true.

9. The linear function that is maximized or minimized in an LPP, is known as
- Objective function
  - Inequality function
  - Equality function
  - None of the above
10. In \_\_\_\_\_ all the constraints of an LPP are satisfied.
- Infeasible region
  - Feasible region
  - Either (a) or (b)
  - Neither (a) nor (b)
11. Which of the following distribution is true for symmetric distribution?
- mean = median = mode
  - mean > median > mode
  - mean < median < mode
  - mean = median = mode
12. The best relative measure of dispersion is
- standard deviation
  - variance
  - coefficient of variation
  - none of the above
13. In a certain distribution, mode = 24, mean = 25.5, the median is
- 25
  - 25.5
  - 26
  - 26.5
14. \_\_\_\_\_ and \_\_\_\_\_ are not effected by the extreme values.
- mean and mode
  - median and mode
  - mean and median
  - none of the above
15. In a certain distribution, CV = 25%, the mean is 60, the standard deviation is
- 12.5
  - 3.75
  - 15
  - 5.25
16. Which of the following statement is true for the determination of trend by using least squares method?
- Trend values can be determined for each period
  - Trend values cannot be determined for each period
  - It is free from subjective error
  - Both (a) and (c)
17. Paasche's index possesses
- upward bias
  - downward bias
  - no bias
  - None of the above
18. If  $r_{XY} = 0$ , the variables X and Y are
- linearly related
  - independent
  - not linearly related
  - not independent
19. The product of the two regression coefficients is
- < 1
  - $\leq 1$
  - > 1
  - $\geq 1$
20. \_\_\_\_\_ index number is an ideal index number.
- Laspeyre's
  - Paasche's
  - Fisher's
  - 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, standard deviation and coefficient of variation of the following distribution: 10  
Age in years (less than): 10 2030 4050 6070 80  
Number of persons : 3 59 1520 2325 26
2. Write in brief the importance of Statistics in managerial decision making. 10
3. a) Why is standard deviation considered as the best measure of dispersion? 4+6=10  
b) Which of the following distribution is more skewed? Justify.  
(i) Mean = 22 median = 24 standard deviation = 10  
(ii) Mean = 23 median = 25 standard deviation = 12
4. a) Explain Time Reversal Test (TRT) and Factor Reversal Test (FRT). 4+6=10  
b) Fit a straight line trend of the following data and estimate sales for the year 2018  
Year : 2011 2012 2013 2014 2015 2016 2017  
Sales: 1012 15 20 18 19 22  
(in crores ₹)
5. If the heights of 500 students are normally distributed with mean 68.0 inches and standard deviation 3.0 inches, how many students have height 3+3+4=10  
(i) Greater than 72 inches  
(ii) Less than 64 inches  
(iii) Between 65 and 71 inches  
[Given Z = 1.00 1.33  
A = 0.8413 0.9082]
6. a) Explain multiple regression with three variables. 5+5=10  
b) The following data are about sales and advertising expenditure of a firm  
Sales Advertising expenditure  
(₹ in crore)(₹ in crore)  
Mean 35 8  
Standard deviation 13 2  
Coefficient of correlation is  $r = 0.85$   
(i) Estimate the likely sales for a proposed advertisement expenditure of ₹12 crores  
(ii) What would be the advertising expenditure if the firm fixes a sales target of ₹50 crores.

7. a) Write the steps of testing of hypothesis.

5+5=10

b) The following table gives the number of aircraft accidents that occurred during the seven days in a week. Find at 5% level of significance, whether the accidents are uniformly distributed over the week.

Days :	Mon	Tue	Wed	Thu	Fri	Sat
No. of accidents:	14	18	12	11	15	14

[Given, the critical value of  $\chi^2$  at 5% level of significance and 5 degree of freedom is 11.07]

8. Solve the following LPP

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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