2023/08

SET A

BACHELOR OF COMMERCE
THIRD SEMESTER [SPECIAL REPEAT]
BUSINESS STATISTICS
BCM – 304
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. Full Marks: 70

Objective

Time: 30 mins. Marks: 20

Choose the correct answer from the following: ***1×20=20***

1. Which of the following is not affected by the extreme values?
   a. mean b. median
   c. mode d. Both b and c
2. If AM = 8, GM = 4, then HM=?
   a. 2 b. 4
   c. 16 d. 12
3. The best relative measure of dispersion is _____
   a. standard deviation b. mean deviation
   c. coefficient of variation d. range
4. The easiest measure of dispersion is _____
   a. Standard deviation b. quartile deviation
   c. variance d. range
5. For two events A and B, if $P(A \cap B) = 0$, then A and B are _____
   a. mutually exclusive b. dependent
   c. independent d. None of the above.
6. Which of the following statement is true for a Binomial distribution?
   a. Mean = Variance b. Mean < Variance
   c. Mean > Variance d. None of the above.
7. For a Poisson variate X with parameter n=6 and p=0.5, the variance of X is _____
   a. 1.5 b. $\sqrt{3}$
   c. 3 d. $\sqrt{1.5}$
8. If Z is a standard normal variate, then the variance of Z is_____
   a. 0 b. 1
   c. μ d. None of the above
9. The correlation coefficient between the two variables X and Y
   a. lies between 0 and 1 b. lies from 0 to 1
   c. lies between -1 and +1 d. lies from -1 to +1

10. The two regression lines coincide, when_____
    a. The product of the two regression coefficients is less than 1.
    b. The product of the two regression coefficients is greater than 1.
    c. The product of the two regression coefficients is equal to 1.
    d. None of the above

11. The product of the two regression coefficients is _____
    a. ≤ 1
    b. < 1
    c. ≥ 1
    d. None of the above

12. Which of the following is an ideal index number?
    a. Laspeyre's index number
    b. Paasche's index number
    c. Fisher's index number
    d. None of the above.

13. Consumer's Price index number is a
    a. wholesale price index number
    b. retail price index number
    c. value index number
    d. None of the above

14. Which of the following averages is not used in the construction of an ideal index number?
    a. Arithmetic Mean
    b. Geometric Mean
    c. Harmonic Mean
    d. None of the above

15. The component of time series associated with the tendency of either increasing or decreasing during the long period of time, is:
    a. Secular trend
    b. Irregular movement
    c. Cyclical variation
    d. Seasonal variation

16. The sales of ice-cream in winter, is the component of
    a. Irregular movement
    b. Cyclical variation
    c. Secular trend
    d. Seasonal variation

17. The variation of time series data due to effect of unpredicted events, is called
    a. Secular trend
    b. Cyclical variation
    c. Irregular variation
    d. Seasonal variation

18. A good estimator of a population mean is
    a. sample variance
    b. sample mean
    c. sample proportion
    d. None of the above

19. A population characteristic is called
    a. parameter
    b. statistic
    c. hypothetical value of the parameter
    d. None of the above

20. Estimating the two values of a statistic where, the true value of a parameter lies, is called
    a. Hypothetical value
    b. Interval estimation
    c. Point estimation
    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, standard deviation and coefficient of variation from the following data: 3+3+3+1=10

Age under (years) :	10	20	30	40	50	60	70	80
No. of persons Dying :	15	30	53	75	100	110	115	125

2. a) State classical and axiomatic definitions of probability. 6+4=10
   b) Out of 100 students in a hostel 80 take tea, 40 take coffee and 25 take both. Find the probability of a student not taking either tea or coffee.

3. a) Write the properties of Poisson distribution. 4+6=10
   b) A machine produces on average 10% defective items. Find the probability that in a sample of 10 items chosen at random, (i) at least one will be defective (ii) exactly three items are defective

4. a) Write the expression of normal distribution. 4+3+3=10
   b) 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 Less than 64 inches Between 65 and 71 inches
   [Given, Z = 1.33, Area = 0.9082]

5. a) Define positive and negative correlations with examples. 4+4+2=10
   b) The following data are about sales and advertising expenditure of a firm:

	Sales (₹ in crores)	expenditure (₹ in crores)
Mean	40	6
Standard deviation	10	1.5

Coefficient of correlation is $r = 0.9$

Estimate the likely sales for a proposed advertisement expenditure of ₹ 10 crores.

What would be the advertisement expenditure if the firm fixes a sales target of 60 crores of rupees

6. a) Discuss the various types of Index Number. 5+3+2=10

b) The following table gives the index numbers for different groups together with their respective weight for 2010 (base year = 2005)

Group	Group Index Number	Group Weight
Food	130	60
Clothing	280	5
Lighting & Fuel	190	7
Rent	300	9
Miscellaneous	210	19

Find out the overall cost of living index number for the year 2010 Suppose a person was earning ₹5000 per month in 2005, what should be his salary in 2010, if his standard of living in the year is to be same in 2005?

7. a) Explain the components of time series. 8+2=10

b) Write short notes on additive and multiplicative models of time series.

8. a) Distinguish between Descriptive statistics and Inferential statistics 5+5=10

b) Write in brief the criteria of a good point estimation

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