

BACHELOR OF COMMERCE
Third Semester
Business Statistics
(BCM-11)

Duration: 3Hrs.

Full Marks: 70

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

1. Answer the following questions: (any five)

2×5=10

- a) Distinguish between relative frequency and cumulative frequency.
- b) If A, B and C are any three events write down the theoretical expression for the following events.
 - (i) Only A occurs. (ii) One does not occur
 - (iii) Simultaneous occurrence of three events. (iv) At most two occur.
- c) Prove that $AM \geq GM \geq HM$
- d) Define Mutually Exclusive events with an example.
- e) What is cyclical variation?
- f) Define correlation coefficient?

2. Answer the following questions: (any five)

3×5=15

- a) From the following series trace out the missing frequencies if its median is 27.5 and number of items is 50.

| | | | | | | |
|-----------|------|-------|-------|-------|-------|-------|
| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| frequency | 4 | ? | 20 | ? | 7 | 3 |

- b) Two dice are tossed. Find the probability of getting an "even number on the first die or a total of 8".
- c) The two lines of regression are given as $X+2Y - 5= 0$ and $2X+3Y= 8$. Then find the mean of X and Y and b_{yx} (regression coefficient of y on x)

- d) Calculate Fishers ideal index from the following data and show that it satisfies Time Reversal Test.

| Commodity | 2000 | | 2004 | |
|-----------|-------|-------|-------|-------|
| | Price | Value | Price | Value |
| A | 10 | 100 | 12 | 96 |
| B | 8 | 96 | 8 | 104 |
| C | 12 | 144 | 15 | 120 |
| D | 20 | 300 | 25 | 250 |
| E | 5 | 40 | 8 | 64 |
| F | 2 | 20 | 4 | 24 |

- e) Find four yearly moving average from the following data
 Year: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981
 1982

Production: 12 14 16 13 16 19 20 22 23 21 24
 25 27

(in Thousand ton)

- f) If A and B are two independent events prove that \bar{A} and B are also independent.

3. Answer the following questions: (any five)

5×5=25

- a) Represent the following by subdivided bar diagram.

| Particulars | 2010 | 2011 | 2012 |
|--------------------------|------|------|------|
| 1. Cost per chair | 90 | 150 | 210 |
| a) wages | 60 | 100 | 140 |
| b) Other costs | 30 | 50 | 70 |
| c) polishing | 180 | 300 | 420 |
| Total | | | |
| 2. Proceeds per chair | 200 | 300 | 400 |
| 3. Profit(+) Loss (-) | +20 | --- | -20 |

- b) Following is the distribution of marks obtained in certain subject by the students of Baridua College. Find (i) median (ii) First quartile (iii) Third quartile (iv) Seventh decile and (V) 42 nd percentile.

| | | | | | | | | | |
|-----------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 |
| No. of students | 2 | 10 | 22 | 35 | 46 | 50 | 30 | 12 | 5 |

- c) Find the line of regression of y on x from the following data:

| | | | | | | | | |
|---|----|----|----|----|----|----|----|----|
| X | 5 | 10 | 15 | 25 | 30 | 35 | 40 | 45 |
| Y | 25 | 32 | 44 | 32 | 39 | 49 | 55 | 60 |

What will be the value of y for $x = 48$? Also find the value of r (correlation coefficient).

- d) Discuss the problems of selection of base period and commodities for construction of price index number.
- e) Write the probability mass function of Binomial Distribution. Deduce mean and variance of the distribution.
- f) What are the components of time series? Discuss them with examples and mention their uses.

9. When Two variables are uncorrelated then $r=?$

- a) 1
- b) -1
- c) 0
- d) None of these.

10 Sum of absolute deviations about median is

- a) Least
- b) Greatest
- c) Zero
- d) None of these

11. If a variable takes different values at different points of time then the series of values does obtained is called

- a) A.P series
- b) G.P series
- c) time series
- d) None of these.

12. If A & B are two events associated to a random experiment such that $A \subset B$ then

- a) $P(A) \leq P(B)$
- b) $P(A) \geq P(B)$
- c) $P(A) = P(B)$
- d) None of these

13. If one of the regression co-efficients is >1 , then the other must be

- a) = 1
- b) < 1
- c) = 0
- d) None of these

14. When $r= + 1$ or $r= -1$, the lines of regression

- a) coincide
- b) Parallel
- c) Perpendicular
- d) None of these

15. If $r_{xy} = 0.6$ and $b_{xy} = 0.8$, what is the value of b_{yx}

- a) 0.45
- b) 0.46
- c) 0.55
- d) None of these

16. The mean and variance are equal for the

- a) Normal distribution
- b) Binomial distribution
- c) Poisson distribution
- d) F-distribution.

17. The coefficient of correlation is independent of

- a) change of scale only
- b) change of origin only
- c) both change of scale and origin
- d) neither change of origin nor change of scale.

18. By _____ we mean the general tendency of the data to increase or decrease over a long period of time.

- a) Secular trend
- b) Seasonal variation
- c) Cyclical variation
- d) none of these

19. In a histogram the height of the rectangles are always _____ to the respective Class interval.

- a) Proportional
- b) Reciprocal
- c) Equal
- d) None of these

20. Mode = _____ - 2 mean.

- a) 2Median
- b) 3 Median
- c) 4Median
- d) None of these
