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1 SEM TDC STSH (CBCS) C 1 (N/O)

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(November)

STATISTICS

(Core)

Paper : C-1

(Descriptive Statistics)

*The figures in the margin indicate full marks
for the questions*

(New Course)

Full Marks : 55

Pass Marks : 22

Time : 3 hours

1. Choose the correct answer from the following alternatives : 1×6=6

(a) Statistics cannot work with

(i) single observation

(ii) multiple observation

(iii) quantitative observation

(iv) All of the above

- (b) Which of the following measures of central tendency can be considered as a positional average?
- (i) Median
 - (ii) Mode
 - (iii) Arithmetic mean
 - (iv) Geometric mean
- (c) Choose the correct relationship among arithmetic mean (AM), geometric mean (GM) and harmonic mean (HM).
- (i) $AM \geq GM \geq HM$
 - (ii) $HM \geq GM \geq AM$
 - (iii) $GM \geq AM \geq HM$
 - (iv) None of the above
- (d) The value of correlation coefficient r lies between
- (i) 0 and 1
 - (ii) -1 and +1
 - (iii) -1 and 0
 - (iv) 0 and +1

- (e) Correlation coefficient r is independent of
- (i) origin only
 - (ii) scale of measurement only
 - (iii) both change of origin and scale of measurement
 - (iv) None of the above
- (f) Index for base period is always taken as
- (i) 100
 - (ii) 1
 - (iii) 200
 - (iv) 0

2. Answer the following questions in brief :

2×6=12

- (a) Distinguish between parameter and statistic.
- (b) For two values of x_1 and x_2 , prove that
- $$AM \geq GM \geq HM$$
- (c) What is the purpose served by coefficient of variation?

- (d) State the assumptions relating to Pearson's coefficient of correlation.
- (e) State the limitations of multiple correlation.
- (f) Define price relative and quantity relative.
3. (a) Discuss the different scales of measurement of data with appropriate examples.

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Or

- (b) What are the objectives served by tabulation? The class frequencies for studying two attributes A and B are as follows :

$$(AB) = 128, (\alpha B) = 384, (A\beta) = 24, (\alpha\beta) = 72$$

Find out the type of association between A and B . 3+4=7

4. Answer any *two* of the following questions : 7×2=14

- (a) Define measure of central tendency and discuss the characteristics of an ideal measure of central tendency. What do you mean by weighted average? 2+3+2=7

- (b) Describe the essential characteristics of an ideal measure of dispersion. Explain the methods of measuring skewness and kurtosis of a frequency distribution.

3+4=7

- (c) What are moments? Explain the procedure of calculating the first four raw and central moments and discuss the relationship between the two. 2+5=7

5. (a) What do you mean by bivariate data? Define multiple and partial correlation with examples. Prove that Spearman's rank correlation coefficient is given by

$$1 - \frac{6\sum d_i^2}{n^3 - n} \quad 1+3+5=9$$

Or

- (b) Can $Y = 5 + 2.8X$ and $X = 3 - 0.5Y$ be the estimated regression equations of Y on X and X on Y respectively? Explain your answer with suitable theoretical arguments. Determine the normal equations for the second-degree parabola $Y = a + bx + cx^2$, where a , b and c are constants. 4+5=9

6. (a) What are Laspeyres', Paasche's and Fisher's index numbers? Prove that Fisher's index number lies between Laspeyres' and Paasche's index numbers. 3+4=7

Or

- (b) What is meant by consumer's price index number? Discuss briefly the main steps in the construction of consumer's price index number. 2+5=7

(7)

(Old Course)

Full Marks : 50
Pass Marks : 20

Time : 2 hours

1. Choose the correct answer from the following alternatives : 1×5=5

(a) Statistics cannot work with

(i) single observation

(ii) multiple observation

(iii) quantitative observation

(iv) All of the above

(b) Which of the following measures of central tendency can be considered as a positional average?

(i) Median

(ii) Mode

(iii) Arithmetic mean

(iv) Geometric mean

- (c) Choose the correct relationship among arithmetic mean (AM), geometric mean (GM) and harmonic mean (HM).
- (i) $AM \geq GM \geq HM$
 - (ii) $HM \geq GM \geq AM$
 - (iii) $GM \geq AM \geq HM$
 - (iv) None of the above
- (d) The value of correlation coefficient r lies between
- (i) 0 and 1
 - (ii) -1 and +1
 - (iii) -1 and 0
 - (iv) 0 and +1
- (e) Index for base period is always taken as
- (i) 100
 - (ii) 1
 - (iii) 200
 - (iv) 0

2. Answer the following questions in brief : 2×5=10

(a) Distinguish between parameter and statistic.

(b) For two values of x_1 and x_2 , prove that
$$AM \geq GM \geq HM$$

(c) What is the purpose served by coefficient of variation?

(d) State the limitations of multiple correlation.

(e) Define price relative and quantity relative.

3. (a) Discuss the different scales of measurement of data with appropriate examples. 6

Or

(b) What are the objectives served by tabulation? The class frequencies for studying two attributes A and B are as follows :

$$(AB) = 128, (\alpha B) = 384, (A\beta) = 24, (\alpha\beta) = 72$$

Find out the type of association between A and B. 3+3=6

(10)

4. Answer any two of the following questions : 7×2=14

(a) Define measure of central tendency and discuss the characteristics of an ideal measure of central tendency. What do you mean by weighted average? 2+3+2=7

(b) Describe the essential characteristics of an ideal measure of dispersion. Explain the methods of measuring skewness and kurtosis of a frequency distribution. 3+4=7

(c) What are moments? Explain the procedure of calculating the first four raw and central moments and discuss the relationship between the two. 2+5=7

5. (a) What do you mean by bivariate data? Define multiple and partial correlation with examples. Prove that Spearman's rank correlation coefficient is given by

$$1 - \frac{6\sum d_i^2}{n^3 - n}$$

1+3+4=8

Or

- (b) Can $Y = 5 + 2.8X$ and $X = 3 - 0.5Y$ be the estimated regression equations of Y on X and X on Y respectively? Explain your answer with suitable theoretical arguments. Determine the normal equations for the second-degree parabola $Y = a + bx + cx^2$, where a , b and c are constants.

4+4=8

6. (a) What are Laspeyres', Paasche's and Fisher's index numbers? Prove that Fisher's index number lies between Laspeyres' and Paasche's index numbers.

3+4=7

Or

- (b) What is meant by consumer's price index number? Discuss briefly the main steps in the construction of consumer's price index number.

2+5=7
