

63/1 (SEM-3) GE3/COMHG3036

2 0 2 2

(Held in 2023)

COMMERCE

Paper : COMHG3036

(**Business Statistics**)

Full Marks : 80

Pass Marks : 32

Time : 3 hours

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

1. Choose the correct answer : 1×6=6

(a) Which of the following deciles are less than the first quartile?

(i) D_1 and D_2

(ii) D_2 and D_3

(iii) D_1, D_2 and D_3

(iv) All of the above

(2)

- (b) Base period for an index number should be
- (i) a year only
 - (ii) a normal period
 - (iii) a period of distant past
 - (iv) All of the above
- (c) Employees strike in a company is an example of
- (i) secular trend
 - (ii) seasonal variation
 - (iii) cyclical variation
 - (iv) irregular variation
- (d) If the correlation coefficient between X and Y is negative, then the regression coefficient of Y on X is
- (i) positive
 - (ii) negative
 - (iii) not certain
 - (iv) None of the above

KB23/460

(Continued)

(3)

- (e) Which of the following is a unitless measure?
- (i) Median
 - (ii) Standard deviation
 - (iii) Mean deviation
 - (iv) Coefficient of correlation
- (f) If A is an uncertain event associated with a random experiment, then
- (i) $0 \leq P(A) \leq 1$
 - (ii) $0 < P(A) \leq 1$
 - (iii) $0 \leq P(A) < 1$
 - (iv) None of the above

2. Answer the following questions : $2 \times 5 = 10$

- (a) If the AM and GM of the two numbers are 5 and 4 respectively, determine the HM.
- (b) If $P(A) = \frac{1}{4}$, $P(B) = \frac{2}{5}$, $P(A \cup B) = \frac{1}{2}$, then find $P(A \cap B)$.
- (c) Mention two differences between correlation and regression.
- (d) What is consumer price index?

KB23/460

(Turn Over)

- (e) If two unbiased coins are thrown, then write down the probability distribution of appearing the number of heads.

3. Answer any six of the following questions :

$$5 \times 6 = 30$$

- (a) Find the mode of the following distribution :

Expenditure (₹) :	0-100	100-200	200-300	300-400	400-500
No. of families :	14	23	27	21	15

- (b) What is average? Which measure of average is the best and why?

- (c) Given below the arithmetic mean, the median and the standard deviation of two distributions. Determine which distribution is more skewed :

(i) AM = 22; Median = 24 and SD = 10

(ii) AM = 22; Median = 25 and SD = 12

- (d) A problem is given to three students A, B, C whose chance of solving the problem are $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ respectively. If they try to do it independently, what is the probability that the problem will be solved?

- (e) In a contest, two judges ranked eight candidates A, B, C, D, E, F, G and H in order of their performances as shown in the following table. Find the rank correlation coefficient from the given data :

Candidates	:	A	B	C	D	E	F	G	H
First judge	:	5	2	8	1	4	6	3	7
Second judge	:	4	5	7	3	2	8	1	6

- (f) What is index number? Explain why index numbers are called economic barometer.

- (g) Production in a sugar mill is given below. Fit a linear trend by the method of least squares and estimate the production for the year 2022 :

Year	:	2014	2015	2016	2017	2018	2019	2020
Production ('000 quintals)	:	40	45	46	42	47	49	46

- (h) Define the following terms :

Random experiment ; Trial ; Event ;
Mutually exclusive events ;
Exhaustive events.

(6)

- (i) In a certain class the average marks obtained by 100 students in statistics was 72. The average marks obtained by 70 boys were 75. Find the average marks of the girls.

4. Answer any *two* of the following questions :

$$10 \times 2 = 20$$

- (a) Calculate mean, mean deviation from the mean and coefficient of mean deviation for the following distribution :

$$4 + 4 + 2 = 10$$

Class interval	:	0-4	4-8	8-12	12-16	16-20
Frequency	:	4	6	8	5	2

- (b) Define binomial probability distribution, Poisson probability distribution and normal probability distribution. Mention four properties of Poisson probability distribution.

$$2 + 2 + 2 + 4 = 10$$

- (c) Explain the concept of time series and analysis of time series. What are the utilities of time series analysis? Also mention the various components of time series.

$$3 + 3 + 2 + 2 = 10$$

KB23/460

(Continued)

(7)

5. Answer any *one* of the following questions : 14

- (a) Discuss the problems that arise in the construction of index numbers. Calculate index numbers from the following data using Laspeyres', Paasche's and Fisher's formulae :

$$8 + 2 + 2 + 2 = 14$$

Articles	Base years		Current years	
	Price	Quantity	Price	Quantity
A	4	8	9	10
B	3	7	5	8
C	4	6	8	5
D	2	5	4	7

- (b) Explain with example, the concept of correlation between two variables. Interpret the various values of Karl Pearson's coefficient of correlation (r). From the following bivariate distribution, obtain the regression line/equation of Y on X and predict the value of Y when X = 9 :

$$4 + 5 + 5 = 14$$

X	:	6	2	10	4	8
Y	:	9	11	5	8	7

KB23—650/460

63/1 (SEM-3) GE3/COMHG3036