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3 SEM TDC BUST (CBCS) GE 303

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(Nov/Dec)

COMMERCE

(Generic Elective)

Paper : GE–303

(Business Statistics)

Full Marks : 80

Pass Marks : 32

Time : 3 hours

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

1. Answer any *eight* questions of the following :
   2×8=16

   (a) State two important objects of measures
   of central value.

   (b) Define seasonal variation in time series
   with example.

   (c) Mention two limitations of classical
   definition of probability.

(*Turn Over*)

(d) The arithmetic means of runs scored by two batsmen X and Y in a series of 10 innings are 20 and 25 respectively. The standard deviations of their runs are 4 and 8 respectively. Who is the most consistent of the two?

(e) What do you mean by coefficient of correlation between two variables?

(f) Distinguish between standard deviation and standard error.

(g) Mention two uses of consumer price index number.

(h) Define chronological data with an example.

(i) A binomial variate X has mean 6 and variance 4. Find the values of n and p.

(j) Define stratified random sampling.

(k) Show that Fisher's formula satisfies factor reversal test.

2. (a) (i) The arithmetic mean and geometric mean of two observations are 5 and 4 respectively. Find the observations.   3

(ii) Calculate mode from the following frequency distribution :   4

Class	20–29	30–39	40–49	50–59	60–69
Frequency	8	12	4	15	9

(iii) Distinguish between absolute and relative measures of dispersion.   2

Or

(b) (i) The average salary of male employees in a factory was ₹ 5,200 and that of females was ₹ 4,200. The mean salary of all the employees was ₹ 5,000. Find the ratio of male and female employees in the factory.   3

(ii) Calculate variance from the following data :   4

Class	10–20	20–30	30–40	40–50	50–60
Frequency	8	12	9	11	10

(iii) Define skewness. For a frequency distribution if Mean = 25, Mode = 30 and Variance = 25, find coefficient of skewness.   1+1=2

3. (a) (i) Explain the meaning of the statement—"The probability of occurrence of an event A is $\frac{1}{5}$".   2

(ii) A problem is given to three students X, Y and Z. The probability of solving the problem by X, Y and Z are $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ respectively. Find the probability that the problem will be solved. 3

(iii) Under what conditions binomial probability distribution can be used? 3

(iv) Define a random variable. A random variable X has the following probability distribution :

x	0	1	2	3
$p(x)$	$\frac{1}{8}$	K	$\frac{1}{4}$	$\frac{1}{8}$

Find the value of K. 2+3=5

Or

(b) *(i)* State the properties of normal probability distribution. 3

(ii) Define Poisson probability distribution with an example. 2

(iii) A die is thrown. If X denotes the point on the uppermost face, find $E(X)$. 4

(iv) A coin is tossed six times. Find the probability of getting at least four heads. 4

4. *(a)* *(i)* Distinguish between correlation and regression. 4

(ii) From the following data, find the two regression equations : 3+3=6

X	70	75	81	84	90
Y	100	105	95	110	115

(iii) Why are there two lines of regression? 3

Or

(b) *(i)* Show that coefficient of correlation ranges from −1 to +1. 4

(ii) The regression lines have the equations $x+2y=5$ and $2x+3y=8$. Find $\bar{x}$, $\bar{y}$ and coefficient of correlation. 2+4=6

(iii) What is Spearman's rank correlation? 3

5. *(a)* *(i)* What is time reversal test? Show that Fisher's formula satisfies time reversal test. 4

(ii) Calculate Fisher's price and quantity index number from the following data :   3+3=6

Items	Base Year		Current Year	
	Price (₹)	Quantity	Price (₹)	Quantity
A	10	4	15	6
B	12	5	20	8
C	8	2	10	5
D	4	6	5	10

(iii) What are the limitations of index number?   3

Or

(b)   *(i)* Why is index number called economic barometer?   3

(ii) Calculate cost of living index number from the given data :   6

	Price		
Items	Base Year	Current Year	Weight
A	10	18	3
B	15	30	2
C	9	12	4
D	20	32	1

(iii) Write the differences between chain-base index number and fixed-base index number.   4

6. *(a)*   *(i)* What do you understand by analysis of time series? What is the need to analyze a time series?   1+3=4

(ii) Calculate trend values by the method of least squares from the data given below :   4

Year : 2000 2001 2002 2003 2004 2005
Sales : 45   50   48   52   55   60

(iii) What are the models used in time series analysis?   3

Or

(b)   *(i)* Explain cyclical variations in a time series. How do seasonal variations differ from them?   2+2=4

(ii) Calculate 3-yearly moving average from the data given below :   4

Time : T_1 T_2 T_3 T_4 T_5 T_6 T_7 T_8 T_9
Value : 8   4   9   6   10   12   7   15   11

(iii) What are the disadvantages of moving average method?   3

7. *(a)*   *(i)* Write a note on sampling error.   3

(ii) What is simple random sampling?   2

Or

(b)   *(i)* What do you mean by sampling distribution?   2

(ii) What are the merits of stratified random sampling?   3

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