

3 SEM TDC BUST (CBCS) GE 303

2022

(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.

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

Items	Price		Weight
	Base Year	Current Year	
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 : T₁ T₂ T₃ T₄ T₅ T₆ T₇ T₈ T₉
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
