

3 SEM TDC BUST (CBCS) GE 303

2021

(Held in January/February, 2022)

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) Define cross-sectional data. Give an example.
- (b) If the geometric mean of x , 4, 8 is 6; then find the value of x .
- (c) What are the limitations of the classical approach to probability?
- (d) Define equally likely events with an example.

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(Turn Over)

- (e) What do you mean by regression analysis?
 - (f) Why are index numbers known as economic barometer?
 - (g) Define price index number and quantity index number.
 - (h) What are the components of a time series?
 - (i) Calculate the range and its coefficient from the following data :
12, 8, 9, 10, 4, 14, 15
 - (j) Give the definitions of parameters and statistics.
 - (k) Mention the methods of non-random sampling.
2. (a) (i) What are the requisites of a good average?
3
- (ii) In a factory employing 3000 persons, 5 percent earn less than ₹ 150 per day, 580 earn from ₹ 151 to ₹ 200 per day, 30 percent earn from ₹ 201 to ₹ 250 per day, 500 earn from ₹ 251 to ₹ 300 per day, 20 percent earn from ₹ 301 to ₹ 350 per day and the rest earn

- ₹ 351 or more per day. Find the median wage of the employees in that factory. 4
- (iii) Define skewness. 2
Or
- (b) (i) Find the geometric mean of two numbers if their arithmetic mean is 15 and the harmonic mean is 9.6. 1
- (ii) Find the standard deviation from the following frequency distribution : 5
- | | | | | | |
|-----------|-------|-------|-------|-------|-------|
| Weight | 44-46 | 46-48 | 48-50 | 50-52 | 52-54 |
| Frequency | 3 | 24 | 27 | 21 | 5 |
- (iii) Which is the best measure of dispersion? Explain why. 1+2=3
3. (a) (i) Define event. 1
- (ii) Can two events be mutually exclusive and independent simultaneously? Support your answer with an example. 1+2=3
- (iii) Find the probability that a leap year selected at random will contain 53 Sundays. 3
- (iv) Discuss the importance of probability theory in business decision making. 4
- (v) What are the assumptions or conditions for binomial distribution? 2

Or

- (b) (i) A bag contains 6 red and 8 green balls. If two balls are drawn at random, then what is the probability that one is red and the other is green? 3

(ii) State the Bayes' theorem. 2

(iii) Ten coins are tossed simultaneously. Find the probability of getting at least seven heads. 6

(iv) Under what conditions normal distribution is regarded as the limiting form of binomial distribution? 2

4. (a) (i) State the properties of Karl Pearson's coefficient of correlation. Give the interpretations when the correlation coefficient takes the values 0, 1 and -1. 3+2=5

(ii) Given the two regression equations :
 $8X - 10Y + 66 = 0$ and $40X - 18Y = 214$
 Find the coefficient of correlation between X and Y. 5

(iii) If X and Y are two variables, then how many regression lines can we have? Explain briefly. 1+2=3

Or

(b) (i) Define correlation analysis. Discuss different types of correlation. 3

(ii) What do you mean by regression analysis? Write the four properties of regression coefficients. 1+4=5

(iii) Compute the coefficient of correlation from the following results : 5

$n = 10, \Sigma x = 125, \Sigma y = 80, \Sigma x^2 = 1586$
 $\Sigma y^2 = 650, \Sigma xy = 1007$

5. (a) (i) Define index numbers. What are different types of index numbers? Name each of them. 2+3=5

(ii) From the following data, calculate the quantity index number by using Laspeyre's formula : 5

Items	Base Year		Current Year	
	Price (in ₹)	Quantity	Price (in ₹)	Quantity
A	5	50	10	56
B	3	100	4	120
C	4	60	6	60
D	11	30	14	24
E	7	40	10	36

(iii) What is the importance of consumer price index? 3

Or

(b) (i) Which index number is considered as the ideal one and why? 1+2=3

(ii) Calculate the cost of living index from the given data : 5

Group	Index Number	Weights
Clothing	360	60
Food	298	5
Fuel and lighting	287	7
House rent	110	8
Miscellaneous	315	20

(iii) What are the tests to check the adequacy of index numbers? Explain briefly any one of them. 1+4=5

6. (a) (i) What is time series? Explain briefly its main components. 1+4=5

(ii) Calculate the trend values by using 3 yearly moving averages for the following data : 3

Year	2008	2009	2010	2011	2012	2013
Production	77	88	94	85	91	98

(iii) Define seasonal index. What are the methods to construct seasonal indices? 1+2=3

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(Continued)

Or

(b) (i) What do you mean by seasonal variation? Give a reason why we should remove the seasonal effects from a given time series. 1+2=3

(ii) Following table gives the figures of production (in thousand quintals) of a sugar factory :

Year	2014	2015	2016	2017	2018	2019	2020
Production	80	90	92	83	94	99	92

Fit a straight line trend to the given data. Plot the data points on graph and show the trend line. Also find the production for the year 2021. 4+2+2=8

7. (a) (i) What are the principles of sampling? 2

(ii) Write a short note on one of the non-random sampling methods. 3

Or

(b) (i) Mention any two drawbacks of simple random sampling. 2

(ii) Distinguish between stratified random sampling and cluster sampling. 3
