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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.

(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?

(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? $1+2=3$

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

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