



**WEST BENGAL STATE UNIVERSITY**  
B.Com. Honours 2nd Semester Supplementary Examination, 2021

**FACHGEC02T -B.COM. (GE2)**

**BUSINESS MATHEMATICS AND STATISTICS**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

1. Answer any **five** questions from the following:

2×5 = 10

- (a) If  $f(x) = |x-3| + |x-1|$ , find  $f(2)$ .
- (b) For what value of  $f(3)$ ,  $f(x) = \frac{x^2-9}{x-3}$  will be continuous at 3?
- (c) If  $x = 5 + at^2$  and  $y = 2at$ , then find  $\frac{dy}{dx}$ .
- (d) Find  $\lim_{x \rightarrow 2} \frac{3x^2 - 4x + 7}{3x - 5}$
- (e) Find the median of 94, 33, 86, 68, 32, 80, 48, 70.
- (f) If  $A = \begin{pmatrix} 2 & -1 \\ 1 & 3 \end{pmatrix}$ ;  $B = \begin{pmatrix} -1 & 3 \\ 0 & 2 \end{pmatrix}$  then find  $2A + 3B$ .
- (g) Two regression lines are given by  $3x - 2y = 5$ ,  $2x - y = 4$ . Find  $\bar{x}$  and  $\bar{y}$ .
- (h) What are the major uses of Time series?

2. Answer any **four** questions from the following:

5×4 = 20

- (a) If  $A = \begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}$  and  $B = \begin{pmatrix} 1 & -2 \\ -3 & 2 \end{pmatrix}$  then find  $AB$  and  $BA$ . Examine whether  $AB = BA$ .
- (b) Solve by Cramer's rule:  
 $x - 2y + z + 1 = 0$ ,  $3x + y - 2z - 4 = 0$ ,  $y - z - 1 = 0$
- (c) The A.M. calculated from the following distribution is known to be 67.45. Find the unknown frequency.

Height (inches)	60-62	63-65	66-68	69-71	72-74
Frequency	15	54	f	81	24

(d) Prove that  $\begin{vmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{vmatrix} = 0$

(e) Find the correlation coefficient from the following data:

$$\begin{array}{ccccccc} X = & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ Y = & 6 & 8 & 11 & 9 & 12 & 10 & 14 \end{array}$$

(f) Find the three-year weighted moving averages with weights 1, 4, 1 for the following series:

$$\begin{array}{ccccccc} \text{Year:} & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \text{Value:} & 2 & 6 & 1 & 5 & 3 & 7 & 2 \end{array}$$

3. Answer any **two** questions from the following:

10×2 = 20

(a) Represent the following data in a frequency distribution table taking 5 equal class intervals and then calculate the mode of the distribution.

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60	45	41	32	47	45	50	37	53	17
26	39	59	68	44	12	30	25	36	18
45	62	46	29	32	54	41	14	32	30

(b) Using the following data compute Fisher's ideal price index number for the current year

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Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

(c) (i) Without using Venn-diagram prove for any two sets  $A$  and  $B$  that  $(A \cup B)^c = A^c \cap B^c$

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(ii) Find the amount of an immediate annuity of Rs. 100 per annum left unpaid for 10 years, allowing 5% p.a. compound interest.

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[Given  $\log 1.629 = 0.2120$ ]

(d) (i) Show that the maximum value of  $x^3 + \frac{1}{x^3}$  is less than its minimum value.

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(ii) If  $A = \left\{ \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8} \right\}$  and  $B = \left\{ \frac{1}{3}, \frac{2}{3}, \frac{1}{5}, \frac{2}{5}, \frac{1}{7}, \frac{2}{7}, \frac{1}{9} \right\}$  then prove that  $A - B = A \cap B'$

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**N.B. :** Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.

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Answer Script Submission e-mail Id: [scm.splexam.21@gmail.com](mailto:scm.splexam.21@gmail.com)