



WEST BENGAL STATE UNIVERSITY
B.Com. Programme 2nd Semester Examination, 2020

FACGCOR04T-B.COM. (DSC4)

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.*

GROUP-A

1. Answer any *five* questions from the following: 2×5 = 10
- (a) If $U = \{1, 3, 5, 7, 9, 12, 15\}$ be a universal set and $A = \{1, 5, 9, 15\}$
 $B = \{3, 7, 9, 12, 15\}$ are two subsets of U then find $(A \cap B) \cup (A - B)$.
- (b) If $A = \begin{pmatrix} x & y \\ u & v \end{pmatrix}$, then show that $\text{adj}(\text{adj } A) = A$.
- (c) Evaluate: $\lim_{x \rightarrow 3} \frac{\sqrt{x} - \sqrt{3}}{x^2 - 9}$.
- (d) Find $\frac{dy}{dx}$, where $y = e^{x^2+2}$.
- (e) Find the median of 94, 33, 85, 67, 32, 81, 48, 69.
- (f) In a distribution, median is 30, A.M. is 27; find mode.
- (g) If $b_{yx} = -0.9$ and $b_{xy} = -0.4$, find r_{xy} .
- (h) Find the Geometric Mean (G. M.) of 3, 6, 24, 48.

GROUP-B

Answer any *four* questions from the following

5×4 = 20

2. In a class of 25 students, 12 students have taken Economics, 8 students have taken Economics but not Mathematics. Find the number of students who have taken Economics and Mathematics and those who have taken Mathematics but not Economics (by set theory solve it).
3. Solve the system of equations by Cramer's rule:
 $2x - 3y + z = 4$; $x - y + z = 6$; $3x + 5y - z = 19$
4. Calculate the compound interest on Rs. 1,500 at 5% in 4 years, the interest being compounded annually.
5. Show that the maximum value of $x^3 + \frac{1}{x^3}$ is less than its minimum value.

6. The weight in pounds of 48 students of a class are given below:

110 160 150 105 175 172 125 120 136 169 140 135
 100 178 170 118 168 154 110 127 149 124 80 140
 120 90 165 126 108 136 95 155 112 156 95 102
 125 130 85 137 128 120 88 164 128 175 149 168

Arrange the above data in the frequency distribution consisting of 10 classes intervals by tally marks.

7. Calculate the mean deviation from the mean for the following data:

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	6	5	8	15	16

GROUP-C

Answer any *two* questions from the following

10×2 = 20

8. An incomplete distribution is given below:

10

Variable	10-20	20-30	30-40	40-50	50-60	60-70	70-80	Total
Frequency	12	30	?	65	?	25	18	229

If median is 46 then find (i) the missing frequencies and (ii) Arithmetic mean of completed table.

9. (a) If $x = ct$, $y = \frac{c}{t}$; find $\frac{dy}{dx}$, where c, t are constant and variable respectively.

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(b) Find the standard deviation (S.D.) of the following frequency distribution:

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Height (inch.)	60-62	62-64	64-66	66-68	68-70
No. of students	35	27	20	13	5

10.(a) Fit a straight line trend by the method of least squares and estimate the trend values:

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Year	1961	1962	1963	1964	1965	1966	1967	1978
Value	80	90	92	83	94	99	92	104

(b) Construct five-yearly moving averages of the number of students studying in a college:

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Yr.	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
No.	332	317	357	392	402	405	410	427	405	431

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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