Alipurduar College (Govt. Sponsored)

Internal Assessment

B.Com. Program – 4th Semester

Business Mathematics & Statistics (DSC – 8)

Full Marks – 20

Answer any one:

1. a) Define : (i) Null Matrix (ii) Unit Matrix (iii) Orthogonal Matrix

b) A function *f(x)* is defined as follows:

$$f(x) = 2x - 1 \text{ , if } x < 3$$

$$= k \quad \text{, if } x = 3$$

$$= 8 - x \text{ , if } x > 3$$

For what value of k, *f(x)* is continuous at x = 3.

c) Differentiate the function with respect to x.

(i) $\log \log \log x^2$ (ii) $x^2 5^{3x}$

d) The demand function faced by a firm is P = 500 – 0.2x and its cost function is C = 25x + 10000 where P is the price, x is the output and C is the cost. Find the output at which the profit of the firm is maximum.

6 + 4 + 6 + 4

2. a) Marks obtained by 50 students in a weekly test examination are as follows:

Marks	No. of Students
Less than 5	6
Less than 10	16
Less than 15	36
Less than 20	45
Less than 25	50

Find S.D. and coefficient of variation.

b) Fit a linear regression of marks in University examination to the same in the College test.

Serial No.	1	2	3	4	5	6
Marks in College test	35	42	20	50	72	64
Marks in University examination	40	48	24	60	84	68

c) Calculate Arithmetic Mean (A.M) and Median from the following frequency distribution and with the help of empirical relation between Arithmetic Mean (A.M), Median and Mode, find the value of Mode.

Class Interval	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70
Frequency	8	15	25	20	16	10	6

(4+2) + 5 + (6+3)