

Alipurduar College (Govt. Sponsored)  
Internal Assessment  
B.Com. Honours – 4<sup>th</sup> Semester  
Business Mathematics (DSC – 9)  
Full Marks – 20

Answer any one:

1. a) Define the continuity of  $f(x)$  at a point and in a closed interval.

b) The total cost  $C$  of producing  $x$  items is given by

$$C = 1000 + 5x, 0 \leq x \leq 500 \\ = 2000 + 4x, 500 \leq x \leq 2000$$

Show that  $C$  is discontinuous at  $X = 500$

c) The cost function  $C$  for commodity  $q$  is given by  $C = q^3 - 4q^2 + 6q$ . Find the AVC and also find the value of  $q$  for which AVC is minimum.

d) If the demand function is  $p = 12 - x^2$ , then for what value of  $x$ , the elasticity of demand is unity?

5+5+5+5

2. a) The life time of a machine is 12 years. The cost price of the machine is Rs. 100000. The estimate scrap value and the increase in the cost of machine after 12 years are Rs. 30000 and 20% respectively. Find the amount of each equal annual instalment to be deposited at 12% interest p.a. compounded annually.

b) A sum of Rs. 50 is put out for 4 year C.I. at 5% compound interest payable quarterly. Find the effective rate of interest per annum.

c) A dealer altered his trade discount from 15% to 12%. Find the percentage of selling prices altered?

d) A merchant has a 3 months bill for Rs. 4000 which his broker discounts at 5%. Find the rate percent p.a. at least he should earn on the discounted value so that he may not suffer any loss by discounting the bill.

5+5+5+5