**SARASWAT VIDYALAYA'S**

**SRIDORA CACULO COLLEGE OF COMMERCE & MANAGEMENT STUDIES**

**KHORLIM, MAPUSA, GOA.**

**B.Com – Honors / General (CBCS - w. e. f. 2017-18)**

**II ⁿᵈ SEMESTER END EXAMINATION, AUGUST, 2018**

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| Subject : Commercial Arithmetic –II (CC-8) | Duration : 2 Hhrs |
| (Special Repeat-CBCS) | Max. Marks: 80 |

Instructions:- 1. Attempt all the questions.

          2. Attempt each question on a new page and sub-questions together.

          3. No internal choice for sub-questions.

          4. Use of calculator (of any kind) is not allowed.

          5. Figures to the right indicate full marks.

Q.1. Attempt the following:         (4x5 = 20)

   a) If P(3,7), Q(-2, x) and R(5, 2) are such that l(PQ) = l(PR), find x.

   b) Consider a function,

       f(x) = x² + x + 1         for $0 \le x < 6$

       Find f(-3), f(0), f(3) and f(6) if they exist. Also find x if f(x) = 1.

   c) Differentiate the following w.r.t.x

       1. $x^4 - 4x^2 + \frac{7}{x} + 3\sqrt{x} - 5 + 4^x$

       2. $(x^2 + 4)(6x - 2)$

   d) If Z = x⁴+ 5x²y² + y⁴, show that $x\frac{\partial Z}{\partial x} + y\frac{\partial Z}{\partial y} = 4Z$

                            **.OR.**

Q.I. Attempt the following:         ( 4x5 = 20)

   w) Does the points A(4,3), B(6, -2) and C(-11,-3) form a right angle triangle?

   x) Let f(x) = x²– 5x + 6. Find x if f( x + 1) = f (x + 2).

   y) Differentiate the following w.r.t. x

      i)   $\frac{e^x}{3x^2+1}$

   z) If Z = x⁴y² + x²y + 14xy, find  $\frac{\partial^2 Z}{\partial x \partial y}$  and  $\frac{\partial^2 Z}{\partial y \partial x}$

Q.2. Attempt the following:         (4x5 = 20)

   a) Find out the mean proportional between 25 and 81.

b) The Cost function is given by C = 1000x − 8x² +3x³ for x units, find average cost, Marginal cost and Marginal average cost.

c) Show that the points (4,1),(2,-3) and (1,-5) are collinear.

d) Integrate the following w.r.t. x
   i) $x^5 + 5^x + e^x + 5$                    ii) (x + 3)(x – 2)

**.OR.**

Q.II. Attempt the following:                                      (4x5 = 20)
  w) Monthly salaries of two friends are in the ratio 5:6. The company offers them an increment of Rs. 100/- each. The ratio of their new salaries is 26:31. Find their original salaries.

  x) The Cost function C(x) of making x units of a product is given by Rs. $C = 6x^2 + 2x + 30$ and 20 units are made. Find the AC and MC.

  y) Find the co-ordinates of the point dividing the segment joining the point (-5, -3) and (2, -4) externally in the ratio 2:3.

  z) If $\int_1^a (4x + 1)dx = 12$ , find a.

Q.3. Attempt the following:                                      (4x5 = 20)
  a) If the demand function is given by $D = 15 - 4p - p^2$, Find price elasticity of demand when p=2

  b) A line makes equal intercepts on the positive coordinate axes and passes through (3, 2). Find its equation.

  c) Examine the continuity of function f, where
     f(x) = $x^2 + x + 3$            $0 \leq x < 2$
         = $4x + 1$            $2 \leq x \leq 4$          at x=2

  d) If the Marginal cost of a firm is given by $MC = 1 + 2x + 6x^2$ , where x is output. Find the total cost function if the fixed cost is Rs. 100 when the output is zero

**.OR.**

Q.III. Attempt the following:                                      (4x5 = 20)
  w) If the supply $S = -12 + 4p + p^2$, $p$ being the price , find the price elasticity of supply , when p=3.

x) Let A(2, -4) and B(-1, -7) be two given points. Find the equation of a line passing through a point (1, 3) and parallel to Se(AB).

y) Discuss the continuity of the function at the point $x = 4$

$$f(x) = \frac{x^2 - 16}{x - 4} \qquad \text{if } x \neq 4$$
$$\quad = 8 \qquad \text{if } x = 4$$

z) Evaluate the following limits

1. $\lim_{x \to 2} (x + 3)(x^2 - 5)$    2. $\lim_{x \to 4} \frac{x^2 - 16}{x^3 - 65}$

Q.4. Attempt the following: (4x5 = 20)

a) A furniture maker has 6 units of wood and 28 unit hours of free time, in which he will make decorative screen. Two have sold well in the past. He estimates that model I requires 2 units of wood and 7 hours of time, while model II requires 1 unit of wood and 8 hours of time. The prices of models are Rs. 120/- and Rs. 80/- respectively. Formulate the problem as a LPP to maximize his revenue.

b) Of the following two functions, find out which is a demand function and Which is a supply function. Find the equilibrium price and the quantity demanded at that price:  x = 50 – 4p – p²        3p = x - 6

c) If the demand function and supply function for a commodity are respectively : $p = 10 - 6x^2$ and $p = 3x^2 + 8x - 7$. Find the Producer's surplus at  x = 1.

d) By selling 150 mangoes a fruit seller gains the selling price of 30 mangoes. Find the profit per cent.

**.OR.**

Q.IV. Attempt the following: (4x5 = 20)

w) Find the perpendicular distance between the parallel lines:
6y + 4x -6 = 0 and 2x +3y – 6 = 0.

x) For the Total Cost function, $C = 4x - x^2 + 2x^3$ , find the Minimum Average Cost.

y) The demand curve of a commodity is p=20 -3Dand the supply function is p=2D.Find the consumer's surplus under pure competition.

z) A manufacturer allows 20 % discount on list price and further 7 % discount on cash payment. What is the list price of the product which is sold for Rs. 14,880/-?

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