Goa Vidyaprasarak Mandal's
GOPAL GOVIND POY RAITURCAR COLLEGE OF COMMERCE AND ECONOMICS, PONDA - GOA
B.COM. CHOICE BASED CREDIT SYSTEM (SEMESTER - II) EXAMINATION, APRIL 2019

COMMERCIAL ARITHMETIC

Duration: 2 hours **Marks: 80**

Instructions: 1. Attempt all questions
2. Figures to the right indicate full marks.

Q.1 Attempt the following: **(5 x 4=20)**

a. Find a point on y-axis whose distance from (7,5) is 13 units.

b. Find $\frac{dy}{dx}$ for the following:

i) $y = \frac{x+5}{4-x}$

ii) $y = (2x+3)(x-1)$

c. If $f(x) = ax + 6$ and $f(1) = 11$ find a.

d. The ages of A and B are in the ratio 9:4. Seven year hence, the ratio of their ages will be 5:3. Find their ages.

e. Evaluate $\int_1^2 (2x-1)(x+2)\,dx$.

OR

Q.I Attempt the following: **(5 x 4=20)**

p. If A(4,-7) and B(-3,8), find the co-ordinates of the point which divide segment AB internally in the ratio 3:5.

q. Differentiate w.r.t. x

i) $y = x^2 + \frac{1}{x}$ ii) $y = \frac{x+3}{x-1}$

r. If $f(x) = x^2 + 5x + 7$, then find x if $f(x) = f(x+1)$.

s. The income of A and B is in the ratio of 4:3 and their expenditure is in the ratio 3:2. If each of them save ` 600 at the end of a year, find the annual income of A and B.

t. Integrate the following w.r.t. x

i) $(x+2)(x-3)$

ii) $(x+1)(x+5)/x$

Q.2Attempt the following: **(5 x 4=20)**

a. A straight line passes through A(2, –5) and B(4,3), find

i) Equation of line AB

ii) The value of a if AB passes through the point (a–1, a+4).

b. The cost of manufacturing x units is given by C = $x^2 + 6x + 8$. Find the average cost and marginal cost at $x = 8$.

c. Integrate the following w.r.t. x

i) $x^5 - 4x^3 + \frac{2}{x} + e^x$

ii) $(x^2 - x - 12)/(x - 4)$

d. Fatima's age is half that of Leena. When Leena's age doubles, what will be the ratio of Leena's age to that of Fatima's age?.

e. If $D = 25 - 3p - p^2$ is a demand function, find the elasticity of demand when $p = 4$.

OR

Q.II Attempt the following: (5 x 4=20)

p. Find the equation of line passing through (1,2) and the point of intersection of the lines $4x + 3y - 1 = 0$ and $3x - y + 9 = 0$.

q. Differentiate w.r.t. x

ii) $y = x^2 + \sqrt{x}$ ii) $y = (x^2 + 3) / (x - 1)$

r. Find the value of $\int_0^2 x(x-1)$

s. A and B are two partners in a firm sharing the profit in the ratio 4:5. If the firm earns profit of ` 14130 , calculate the amount of profit to be received by each partner.

t. If the demand function is given by $p = 100 - 3D - D^2$, find the elasticity of demand when $D = 5$.

Q.3 Attempt the following: (5 x 4=20)

a. Solve the following LPP by graphical method.
Max Z = 2 x-y such that

$x + y \leq 5$

$x + 2y \leq 8$

$x, y \geq 0$.

b. The demand function is given by $p = 60 + 15D - 5D^2$. Find the total revenue and marginal revenue when demand is 5 units.

c. The ages of Ram and Shyam are in ratio 5:7 and the difference between their ages is 12 years. Find the present age of Ram and Shyam.

d. Evaluate the $\lim_{x \to 3} \frac{(x^2 - 9)}{(x - 3)}$

e. If $z = 2x^3 - 11x^2y + 3y^3$, show that $x\frac{\partial Z}{\partial x} + y\frac{\partial Z}{\partial y} = 3z$.

OR

Q.III Attempt the following: (5 x 4=20)

p. Use graphical method to solve Min Z = 10 x +20y such that

$2x + y \geq 40$

$x + 3y \geq 30$

$x, y \geq 0$.

q. If the total cost of x items is $C = 50 + 15x - x^2$,
find i) the average cost ii) marginal cost when 10 items are produce.

r. A CD is sold for ` 11 and makes the same percentage of profit for which it was purchase. Find its purchase price.

s. Examine the continuity at x=4 of the function
$f(x) = (x^2-16)/(x-4)$ for $x \neq 4$
$f(4) = 9$

t. The cost function is $C(x,y) = 3x^2+2xy+y^2+10$, for two variables x and y. Find the marginal cost at x=1 and y=5.

Q.4 Attempt the following: (5x 4=20)

a. Find the value of x if triangle formed by the points A (x, –4), B(2,3) and C(4,-1) is right angled at C.

b. The supply function for a commodity is $p = x^2 + 5x + 4$, where x is the quantity supplied. Find the producer's surplus, when the price is 10.

c. Raymonds provide a discount of15% on the clothes purchased. Hema purchases clothes worth ` 6000. How much will she pay?

d. The demand and supply laws are given as $p=16 - D^2$ and $p = 2 + D$ respectively. Find the consumer's surplus at equilibrium price.

e. Verify that A=(2,2), B=(–2,4) and C=(2,6) are the vertices of isoceles triangle ABC.

Q.IV Attempt the following: (5 x 4=20)

p. Show that A(1,2), B(0,–5) and C(3,–4) are the vertices of a right angled triangle.

q. Given $f(x) = 100 + 10x - 2x^2$. Find the value of x when $f(x)$ is minimum.

r. Amin bought a scooter for ` 60000 and sold it at ` 75000 less 25% discount. Find his gain or loss percentage.

s. Find the producer's surplus at x=3, if the supply function is $p = 6x - 7$.

t. Write the equation of line parallel to the line $4x - 3y + 10 = 0$ and passing through (1,4).

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