

Goa Vidyaprasarak Mandal's
GOPAL GOVIND POY RAITURKAR COLLEGE OF COMMERCE AND
ECONOMICS

Farmagudi Ponda Goa

B.COM. CBCS (Semester II) Examination, April 2018

COMMERCIAL ARITHMETIC

Duration:- 2 Hours

Marks:-80

Q1 Attempt the following.

(4 x 5 = 20)

- a) Find k, if the distance between (1, 3) and (2,k) is 5 units.
- b) If $f(x) = x^2 + 1$, find x if $f(x + 1) = f(x + 2)$.
- c) Find $\frac{dy}{dx}$ for the following:
- i) $y = \frac{2x + 5}{x - 3}$
- ii) $y = (x + 3)(x - 1)$
- d) If A=(2,2), B=(2,4) and C=(2,6) are the vertices of a triangle ABC, Prove that ABC is an isosceles triangle.
- e) If the total cost in lakhs of rupees for the monthly production of an item is $C = 50 + 15x - x^2$, find i) the marginal cost ii) marginal cost when 6 units are produced.

OR

Q1 Attempt the following.

(4 x 5 = 20)

- p) Find the point on the x axis whose distance from (7,5) is 13 units.
- q) If $f(x) = ax^2 + bx + 2$ and $f(1) = 3, f(4) = 42$, find a and b.
- r) Differentiate with respect to x
- i) $y = \frac{5x - 1}{x + 2}$ ii) $y = (2x^2 + x + 2^x)$
- s) A=(0,3), B=(-2,k) and C=(-1,4) are the vertices of a right angled triangle, right angled at A. Find k.
- t) The demand function is given by $p = 30 + 6D - D^2$. Find the revenue and marginal revenue when demand is 5 units.

Q2 Attempt the following. (4 x 5 = 20)

- a) A straight line passes through P = (2, -5) and Q = (4, 3), find
 i) Equation of line PQ
 ii) The value of a if PQ passes through the point (a-1, a+4).
- b) Find $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - x - 2}$
- c) The cost of manufacturing x units is given by $C = x^2 + 6x + 8$. Find the average cost and marginal cost at $x = 8$.
- d) Prove that (-1, 2), (3, -1) and (2, 6) are the vertices of a right angled triangle.
- e) If $D = 25 - 3p - p^2$ is a demand function, find the elasticity of demand when $p = 3$.

OR

QII Attempt the following. (4 x 5 = 20)

- p) Find the equation of line passing through (0, 2) and the point of intersection of the lines $4x + 3y - 1 = 0$ and $3x - y + 9 = 0$.
- q) Evaluate $\lim_{x \rightarrow 4} \frac{\sqrt{2x+1} - 3}{x^2 - x - 12}$
- r) Differentiate w.r.t. x
 i) $y = e^x + 2^x + x^3$ ii) $y = \frac{3x^2+1}{x-2}$
- s) Write the equation of line parallel to the line $4x - 3y + 10 = 0$ and passing through (1, 4).
- t) If the demand function is given by $p = 100 - 3D - D^2$, find the elasticity of demand when $D = 5$.

Q3 Attempt the following. (4 x 5 = 20)

- a) Evaluate the integral $\int_1^2 (3x^2 + 2x) dx$.
- b) Solve the following LPP by graphical method.
 Max $Z = 23x + 35y$ such that
 $4x + 3y \leq 40$
 $2x + 5y \leq 55$
 $x, y \geq 0$.

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

i) $y = x^6 - 5x^4 + \frac{3}{x} + e^x$ ii) $y = \frac{x^2 - x - 12}{x - 4}$

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

e) The demand function for a commodity is $p = 20 - 2x - x^2$. Find the consumers surplus when $p = 50$.

OR

QIII Attempt the following.

(4 x 5 = 20)

p) Given $f(x) = 100 + 10x - 2x^2$. For what value of x , $f(x)$ is minimum ?

q) A company manufactures two types of bags S:small and B: big. The raw materials and labour available per day are 60 units and 50 hours respectively. S requires 2 units of raw material and 5 hours of labour whereas B requires 6 units of raw material and 2 hours of labour. It is observed that, however they try, the total number of bags produced per day, does not exceed 12. Formulate the above problem to maximise the profit.

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

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

ii) $\frac{(x + 1)(x + 5)}{x}$

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 Rs. 600 at the end of a year, find the annual income of each.

t) The supply function $p = 3x^2 + 5$, find the producers surplus at $x = 5$.

Q 4 Attempt the following.

(4 x 5 = 20)

a) If $z = 3\frac{x^5}{y^4}$; show that $x\frac{\delta z}{\delta x} + y\frac{\delta z}{\delta y} = z$.

b) A person bought a book for Rs. 360. For what price should he sell it to gain 20% ?

c) The supply function for a commodity is $p = x^2 + 5x + 4$, where x is the quantity supplied. Find the producers surplus, when the price is Rs. 10.

- d) The ages of Ram and Shyam are in ratio 5:7 and the difference between their ages is 12 years. Find the present ages of Ram and Shyam.
- e) Bombay Dyeing allows a discount of Rupees 20% on the clothes purchased. Reema purchases clothes worth Rs. 5600. How much will she pay?

OR

Q IV Attempt the following.

(4 x 5 = 20)

- p) If $z = 2x^3 - 11x^2y + 3y^3$, show that $x \frac{\delta z}{\delta x} + y \frac{\delta z}{\delta y} = 3z$.
- q) If 32 is added to 80% of a number, the result is the number itself. Find the number.
- r) Find the producers surplus at $x=3$, if the supply function is $p = 6x - 7$.
- s) Nilesh and Ashok are two partners in a firm sharing the profit in the ratio 4:5. If the firm earns profit of Rs. 14130 in 2010, calculate the amount of profit to be received by each partner.
- t) A house owner increase the rent of the house by 15%. Later he decrease it by 10%. Find the percentage change in the house rent.

End