

CARMEL COLLEGE OF ARTS, SCIENCE AND COMMERCE FOR WOMEN
SEMESTER END EXAMINATION, APRIL – 2019

Semester : II of B.com Subject and Sub Code : COMMERCIAL ARITHMETIC-II (CC 8)

Total Marks : 80

Date : 29/04/2019

Duration : 2 hours

Instructions : 1. All questions are compulsory, however internal choice is available.

2. Figures to the right indicate marks allotted.

3. Non programmable calculators are allowed.

4. Graph papers will be supplied on request.

Q1. Answer any four of the following :

(4 x 4 = 16)

- The mean proportion of two numbers is 24. If one of them is 36, find the other number.
- Differentiate $y = (\log x + 3)^9$ w.r.t. x .
- Two numbers are in the ratio of 5: 6. If 21 is subtracted from each of two numbers, they become in the ratio of 2:3. Find the numbers.
- Find $\frac{dy}{dx}$, if $y = \frac{x^2 + 5x - 3}{x}$.
- 28 carpenters make 96 chairs in a certain period. How many carpenters will make 72 chairs in the same period?
- If the Demand D is given by $D = 12 + 4p - p^2$, p being the price, find the price elasticity of Demand when $p = 3$.

Q2. Answer any four of the following :

(4 x 4 = 16)

- Find the equation of line having y intercept -2 and perpendicular to $3x + y = 7$.
- Find x if $f(x+1) = f(x-1)$ for $f(x) = x^2 + 2x + 5$.
- Evaluate : $\lim_{x \rightarrow 2} \left[\frac{1}{x^2 - 5x + 6} + \frac{1}{2x^2 - 7x + 6} \right]$.
- If f is continuous at $x = 4$, where $f(x) = \frac{x^2 - 16}{x^2 + x - 20}$, $x \neq 4$; find $f(4)$.
- $A = (2, -4)$ and $B = (-1, -7)$. Find the equation of the line through $(2, -5)$ and perpendicular to AB .
- Evaluate : $\int_0^6 (x+1)(x-2) dx$.

Q3. a) Find $\frac{d^2y}{dx^2}$, if (i) $y = x^5 - e^x$ (ii) $y = 4x - 5$.

(6)

b) Find the partial derivatives of $f(x, y) = x^3 + x^2e^y + \log y + 5$ at $(3, -1)$.

(6)

OR

Q3. x) The Demand Function for a commodity is given by $p = 20 - 2D^2$. Find (i) The Total Revenue function (ii) The Marginal Revenue function when $D = 2$.

(6)

- y) For the Cost Function $C(x, y) = 3x^2 + 2xy + y^2 + 10$ for two commodities x and y .

Find the Marginal Costs at $x = 1$ and $y = 5$.

(6)

- Q4. a) The selling price of 35 articles is equal to the print price of 28 articles. Find the rate of discount.

(6)

- b) Find the extremes values of the function $f(x) = 2x^3 - 15x^2 + 36x + 5$.

(6)

OR

- Q4. x) The ratio of milk and water in the mixture of 45 liters is 7 : 2. 11 liters more water is added. Find the ratio of milk and water in the new mixture.

(6)

- y) The Total Cost function is given by $C = 4x^2 + 7x + 3$. Find the Average Cost, Marginal cost when $x = 4$.

(6)

- Q5. a) The distance between $(1, -3)$ and $(-2, y)$ is 5 units. Find y .

(6)

- b) Evaluate : (i) $\int \frac{(x+2)(x-6)}{x^2} dx$ (ii) $\int_0^1 (e^x + 1) dx$

(6)

OR

- Q5. x) Find the coordinates of the points of trisection of AB, if $A = (-2, 5)$ and $B = (4, 7)$.

(6)

- y) If the marginal cost $MC = 3x^2 - 2x + 5$, find the cost function if the fixed cost is 16.

(6)

- Q6. a) The point $P(7, a)$ lies on the line joining $A(-5, 2)$ and $B(3, 6)$. Find the ratio in which P divides AB and hence find a .

(6)

- b) Evaluate : (i) $\int_0^5 \frac{(x^2 - 5x + 6)}{x - 3} dx$ (ii) $\int (x - 2)(x + 7) dx$

(6)

OR

- Q6. x) Solve graphically the following linear programming problem

Maximize $Z = 2x + 5y$, subject to

$$x + y \leq 9$$

$$x + 4y \leq 24,$$

$$3x + y \leq 21 \quad x \geq 0, y \geq 0$$

(6)

- y) The Supply function is $p = 6x - 7$. Find the Producer's Surplus at $x = 3$.

(6)
