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Shree Damodar College of Commerce & Economics

FYBCOM, Semester II, Semester End Examination-April, 2019

Commercial Arithmetic-II

Time: 2 hours Maximum Marks: 80

INSTRUCTIONS:

1. All questions are compulsory (internal choice is provided).
2. Figures to the right indicate full marks.
3. Non Programmable Calculator are allowed.

Q.1 Attempt the following: [5X4]

(a) Find the equation of a line having slope -2 and passing through the point (2,1).

(b) Differentiate the following with respect to x: (i)$x^4 - 4^x + log4$ (ii)$(3x+1)^2$.

(c) If $f(x) = x^2 - 5x + 6, x \in \mathbf{R}$. Find x if $f(x+2) = f(x+1)$.

(d) Evaluate $\int (x+2)(x-1)\,dx$.

(e) For 12 persons in a family, the amount required for 15 days is ₹3,000. How much amount is required for a family of 3 persons for 30 days in the same set-up?

OR

Q. I Attempt the following: [5X4]

(v) Find the coordinates of the point dividing the segment joining the points (0, 0), (3, 4) internally in the ratio 2:1.

(w) Differentiate $y = (4x+9)^4$ with respect to x.

(x) If $f(x) = x^2 + 3x - 5$, $0 \leq x \leq 6$, find $f(2), f(4), f(7)$, whenever they exist. Also find x if $f(x) = 35$.

(y) Evaluate $\int (x^5 - 5^x + 5)\,dx$.

(z) Six men agree to finish a work. After six days, when exactly half the work is left, two of them leave. Find the number of days yet to be taken by the other 4 men to finish the job.

Q.2 Attempt the following: [5X4]

(a) Find $lim_{x \to 0} \frac{3^x - 1}{6x}$.

(b) If the total cost function is given by $C = 4x^2 + 7x + 3$, find the average cost and marginal cost when $x = 6$.

(c) Minimize z =40x+37y
subject to : 10x+3y $\geq$ 180, 2x+3y $\geq$ 60, x $\geq$ 0, y $\geq$ 0.

(d) For the function $f(x, y) = x^2 + 2xy$. Find f_x and f_y at (1, 2).

(e) A dealer is selling an article at a discount of 5 % on the M.R.P. What is the selling price if the M.R.P. is ₹140?

OR

Q. II Attempt the following: [5X4]

(v) If f is continuous at $x = 0$, where

$$f(x) = \begin{cases} 3x + a + b, & x > 0 \\ x + 4 - b & x < 0 \\ 1 & x = 0 \end{cases}$$

find a and b.

(w) The demand function for a commodity is given by $p = 20 - 2D^2$. Find (i) the total revenue function, (ii)the marginal revenue function, (iii) marginal revenue when $D = 2$.

(x) A machine is used for producing two products A and B. Product A is produced by using 3 units of chemical salt and 2 units of chemical mixture. Product B is produced by using 2 units of chemical salt and 4 units of chemical mixture. Only 1000 units of chemical salt and 1500 units of mixture are available. The profit on product A is Rs. 25 and on B, it is Rs. 20 per unit. Give the mathematical formulation for this LPP to maximize the profit.

(y) For $f(x, y) = x^2 + 3y$, find $f(x, y)$, when (i) $x = 2$ (ii) $y = 1$ (iii) $(x, y) = (2, 1)$.

(z) A sells a cycle to B at a profit of 10%, B sells to C at a profit of 20%. If C pays ₹264 for it, how much did A pay for it?

Q.3 Attempt the following: [5X4]

(a) At present Kavita is twice Sarita's age. Eight years hence, the respective ratio between Kavita's and Sarita's ages then will be 22:13. What is Kavita's present age?

(b) AB is the diameter of a circle with center C. If A= (1,-2) and C= (-3,4), find the coordinates of B.

(c) If the marginal revenue function for a certain product is $MR = 4x^3 + 6x^2 + 10x + 1$. Find the Revenue function and Average Revenue when $x = 10$.

(d) If a firm produces an output of x tons at a total cost $C = x^3 - 4x^2 + 7x$. Find the output at which the average cost is the least.

(e) Show that the lines with equations $2y = x + 1$ and $3x - 6y - 8 = 0$ are parallel.

OR

Q. III Attempt the following: [5X4]

(v) Two numbers are in the ratio 3:5. If 9 is subtracted from each number, then they are in the ratio of 12:23. What is the second number?

(w) Write down the equation of a line passing through the points A(1,6) and B(-5,0).

(x) If the marginal cost $MC = 3x^2 + 4x + 5$, find the cost function, if the fixed cost is 150.

(y) Find the values of x, for which the following function $f(x) = x^3 - 75x + 10$ is increasing , decreasing.

(z) Show that points A (2,2). B(3,4) and C(4,1) are the vertices of a right angled triangle.

Q.4 Attempt the following: [5X4]

(a) The sum of 15% of a positive number and 10% of the same number is 70. Find the number?

(b) If the distance between two points (5,a) and (8.4) is 5, find the value of a.

(c) Evaluate $\int_0^6 (x+2)(x-1)\,dx$.

(d) If the demand function for a certain commodity is $p = 24 - 4x$, find the demand consumer's surplus at $x = 5$.

(e) Find $\frac{d^2y}{dx^2}$ for $y = 7x^5 - 4x^2 + 6$.

OR

Q. IV Attempt the following: [5X4]

(v) A candidate wins the election by 2,645 votes, getting 60% of the votes. Find the total number of votes cast.

(w) Find the equation of the line passing through the point (1, 2) and perpendicular to a line $2x - y - 7 = 0$.

(x) Evaluate $\int_{-1}^{1} e^{2x+3}\,dx$.

(y) If the supply function for a certain commodity is $p = 16x + 4$, find the producer's surplus at $x = 1$.

(z) Divide 70 into two parts so that their product is maximum.
