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- Area bounded by the curve $y = x(4 - x)$ between the limits 0 and 4 with x - axis is
(a) $\frac{30}{3}$ sq.units (b) $\frac{31}{3}$ sq.units (c) $\frac{32}{3}$ sq.units (d) $\frac{15}{2}$ sq.units
- Area bounded by the curve $y = e^{-2x}$ between the limits $0 \leq x \leq \infty$ is
(a) 1 sq.units (b) $\frac{1}{2}$ sq.unit (c) 5 sq.units (d) 2 sq.units
- Area bounded by the curve $y = \frac{1}{x}$ between the limits 1 and 2 is
(a) log2 sq.units (b) log5 sq.units (c) log3 sq.units (d) log 4 sq.units
- If the marginal revenue function of a firm is $MR = e^{-\frac{x}{10}}$, then revenue is
(a) $-10e^{-\frac{x}{10}}$ (b) $1 - e^{-\frac{x}{10}}$ (c) $10 \left(1 - e^{-\frac{x}{10}}\right)$ (d) $e^{-\frac{x}{10}} + 10$
- If MR and MC denotes the marginal revenue and marginal cost functions, then the profit functions is
(a) $P = \int (MR - MC) dx + k$ (b) $P = \int (MR + MC) dx + k$ (c) $P = \int (MR)(MC)dx + k$ (d) $P = \int (R - C)dx + k$
- The demand and supply functions are given by $D(x) = 16 - x^2$ and $S(x) = 2x^2 + 4$ are under perfect competition, then the equilibrium price x is
(a) 2 (b) 3 (c) 4 (d) 5
- The marginal revenue and marginal cost functions of a company are $MR = 30 - 6x$ and $MC = -24 + 3x$ where x is the product, then the profit function is
(a) $9x^2 + 54x$ (b) $9x^2 - 54x$ (c) $54x - \frac{9x^2}{2}$ (d) $54x - \frac{9x^2}{2} + k$
- The given demand and supply function are given by $D(x) = 20 - 5x$ and $S(x) = 4x + 8$ if they are under perfect competition then the equilibrium demand is
(a) 40 (b) $\frac{41}{2}$ (c) $\frac{40}{3}$ (d) $\frac{41}{5}$
- If the marginal revenue $MR = 35 + 7x - 3x^2$, then the average revenue AR is
(a) $35x + \frac{7x^2}{2} - x^3$ (b) $35x - \frac{7x^2}{2} - x^2$ (c) $35 + \frac{7x^2}{2} + x^2$ (d) $35 + 7x + x^2$
- The profit of a function p(x) is maximum when
(a) $MC - MR = 0$ (b) $MC = 0$ (c) $MR = 0$ (d) $MC + MR = 0$
- For the demand function p(x), the elasticity of demand with respect to price is unity then
(a) revenue is constant (b) cost function is constant (c) profit is constant (d) none of these
- The demand function for the marginal function $MR = 100 - 9x^2$ is
(a) $100 - 3x^2$ (b) $100x - 3x^2$ (c) $100x - 9x^2$ (d) $100 + 9x^2$
- When $x_0 = 5$ and $p_0 = 3$ the consumer's surplus for the demand function $p_d = 28 - x^2$ is
(a) 250 units (b) $\frac{250}{3}$ units (c) $\frac{251}{2}$ units (d) $\frac{251}{3}$ units
- When $x_0 = 2$ and $P_0 = 12$ the producer's surplus for the supply function $P_s = 2x^2 + 4$ is
(a) $\frac{31}{5}$ units (b) $\frac{31}{2}$ units (c) $\frac{32}{3}$ units (d) $\frac{30}{7}$ units
- Area bounded by $y = x$ between the lines $y = 1$, $y = 2$ with y = axis is
(a) $\frac{1}{2}$ sq.units (b) $\frac{5}{2}$ sq.units (c) $\frac{3}{2}$ sq.units (d) 1 sq.unit
- The producer's surplus when the supply function for a commodity is $P = 3 + x$ and $x_0 = 3$ is

- (a) $\frac{5}{2}$ (b) $\frac{9}{2}$ (c) $\frac{3}{2}$ (d) $\frac{7}{2}$

17) The marginal cost function is $MC = 100\sqrt{x}$. find AC given that $TC = 0$ when the out put is zero is

- (a) $\frac{200}{3}x^{\frac{1}{2}}$ (b) $\frac{200}{3}x^{\frac{3}{2}}$ (c) $\frac{200}{3x^{\frac{3}{2}}}$ (d) $\frac{200}{3x^{\frac{1}{2}}}$

18) The demand and supply function of a commodity are $P(x) = (x - 5)^2$ and $S(x) = x^2 + x + 3$ then the equilibrium quantity x_0 is

- (a) 5 (b) 2 (c) 3 (d) 19

19) The demand and supply function of a commodity are $D(x) = 25 - 2x$ and $S(x) = \frac{10+x}{4}$ then the equilibrium price P_0 is

- (a) 5 (b) 2 (c) 3 (d) 10

20) If MR and MC denote the marginal revenue and marginal cost and $MR - MC = 36x - 3x^2 - 81$, then the maximum profit at x is equal to

- (a) 3 (b) 6 (c) 9 (d) 5

21) If the marginal revenue of a firm is constant, then the demand function is

- (a) MR (b) MC (c) $C(x)$ (d) AC

22) For a demand function p, if $\int \frac{dp}{p} = k \int \frac{dx}{x}$ then k is equal to

- (a) ηd (b) $-\eta d$ (c) $\frac{-1}{\eta d}$ (d) $\frac{1}{\eta d}$

23) Area bounded by $y = e^x$ between the limits 0 to 1 is

- (a) $(e - 1)$ sq.units (b) $(e + 1)$ sq.units (c) $(1 - \frac{1}{e})$ sq.units (d) $(1 + \frac{1}{e})$ sq.units

24) The area bounded by the parabola $y^2 = 4x$ bounded by its latus rectum is

- (a) $\frac{16}{3}$ sq.units (b) $\frac{8}{3}$ sq.units (c) $\frac{72}{3}$ sq.units (d) $\frac{1}{3}$ sq.units

25) Area bounded by $y = |x|$ between the limits 0 and 2 is

- (a) 1sq.units (b) 3 sq.units (c) 2 sq.units (d) 4 sq.units

RAVI MATHS TUITION CENTER, PH - 8056206308

Integral Calculus – II - test 1

Date : 18-Jun-19

12th Standard 2019 EM

Business Maths

Reg.No. :

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Time : 00:45:00 Hrs

Total Marks : 25

6 x 2 = 12

- 1) Using Integration, find the area of the region bounded the line $2y + x = 8$, the x axis and the lines $x = 2$, $x = 4$.
- 2) Find the area bounded by the lines $y - 2x - 4 = 0$, $y = 1$, $y = 3$ and the y-axis
- 3) Calculate the area bounded by the parabola $y^2 = 4ax$ and its latusrectum.
- 4) Find the area bounded by the line $y = x$, the x-axis and the ordinates $x = 1$, $x = 2$
- 5) Using integration, find the area of the region bounded by the line $y - 1 = x$, the x axis and the ordinates $x = -2$, $x = 3$.
- 6) Find the area of the region lying in the first quadrant bounded by the region $y = 4x^2$, $x = 0$, $y = 0$ and $y = 4$

5 x 3 = 15

- 7) Find the area bounded by $y = 4x + 3$ with x- axis between the lines $x = 1$ and $x = 4$
- 8) Find the area of the region bounded by the line $x - 2y - 12 = 0$, the y-axis and the lines $y = 2$, $y = 5$.
- 9) Find the area of the region bounded by the parabola $y = 4 - x^2$, x -axis and the lines $x = 0$, $x = 2$
- 10) Find the area bounded by $y = x$ between the lines $x = -1$ and $x = 2$ with x -axis.
- 11) Find the area of the parabola $y^2 = 8x$ bounded by its latus rectum.

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- 1) The cost of over haul of an engine is Rs. 10,000 The operating cost per hour is at the rate of $2x - 240$ where the engine has run x km. Find out the total cost if the engine run for 300 hours after overhaul.
- 2) Elasticity of a function $\frac{E_y}{E_x}$ is given by $\frac{E_y}{E_x} = \frac{-7x}{(1-2x)(2+3x)}$. Find the function when $x = 2$, $y = \frac{3}{8}$
- 3) The elasticity of demand with respect to price for a commodity is given by $\frac{(4-x)}{x}$, where p is the price when demand is x . Find the demand function when price is 4 and the demand is 2. Also find the revenue function.
- 4) An account fetches interest at the rate of 5% per annum compounded continuously An individual deposits Rs. 1,000 each year in his account. How much will be in the account after 5 years. ($e^{0.25} = 1.284$)
- 5) The marginal cost function is $MC = 300x^{\frac{2}{3}}$ and fixed cost is zero. Find out the total cost and average cost functions.
- 6) Determine the cost of producing 200 air conditioners if the marginal cost (is per unit) is $C'(x) = \frac{x^2}{200} + 4$
- 7) If the marginal revenue function for a commodity is $MR = 9 - 4x^2$. Find the demand function.
- 8) Given the marginal revenue function $\frac{4}{(2x+3)^2} - 1$, show that the average revenue function is $P = \frac{4}{6x+9} - 1$
- 9) A firm's marginal revenue function is $MR = 20e^{-x/10} \left(1 - \frac{x}{10}\right)$. Find the corresponding demand function.
- 10) The marginal cost of production of a firm is given by $C'(x) = 5 + 0.13x$, the marginal revenue is given by $R'(x) = 18$ and the fixed cost is Rs. 120. Find the profit function.
- 11) The marginal cost function of manufacturing x shoes is $6 + 10x - 6x^2$. The cost producing a pair of shoes is Rs.12. Find the total and average cost function.
- 12) A company has determined that the marginal cost function for a product of a particular commodity is given by $MC = 125 + 10x - \frac{x^2}{9}$ where C rupees is the cost of producing x units of the commodity. If the fixed cost is Rs.250 what is the cost of producing 15 units.
- 13) The rate of new product is given by $f(x) = 100 - 90e^{-x}$ where x is the number of days the product is on the market. Find the total sale during the first four days. ($e^{-4} = 0.018$)
- 14) A company produces 50,000 units per week with 200 workers. The rate of change of productions with respect to the change in the number of additional labour x is represented as $300 - 5x^{1/2}$ If 64 additional labours are employed, find out the additional number of units, the company can produce.
- 15) The rate of change of sales of a company after an advertisement campaign is represented as, $f(t) = 3000e^{-0.3t}$ where t represents the number of months after the advertisement. Find out the total cumulative sales after 4 months and the sales during the fifth month. Also find out the total sales due to the advertisement campaign [$e^{-1.2} = 0.3012$, $e^{-1.5} = 0.2231$].
- 16) The price of a machine is 6,40,000 if the rate of cost saving is represented by the function $f(t) = 20,000t$. Find out the number of years required to recoup the cost of the function.

6 x 5 = 30

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Time : 00:50:00 Hrs

Total Marks : 60

FOR ANSWERS WHATSAPP - 8056206308

25 x 2 = 50

- Using Integration, find the area of the region bounded the line $2y + x = 8$, the x axis and the lines $x = 2$, $x = 4$.
- Calculate the area bounded by the parabola $y^2 = 4ax$ and its latusrectum.
- Using integration, find the area of the region bounded by the line $y - 1 = x$, the x axis and the ordinates $x = -2$, $x = 3$.
- The cost of over haul of an engine is Rs. 10,000 The operating cost per hour is at the rate of $2x - 240$ where the engine has run x km. Find out the total cost if the engine run for 300 hours after overhaul.
- Elasticity of a function $\frac{Ey}{Ex}$ is given by $\frac{Ey}{Ex} = \frac{-7x}{(1-2x)(2+3x)}$. Find the function when $x = 2$, $y = \frac{3}{8}$
- The elasticity of demand with respect to price for a commodity is given by $\frac{(4-x)}{x}$, where p is the price when demand is x. Find the demand function when price is 4 and the demand is 2. Also find the revenue function.
- An account fetches interest at the rate of 5% per annum compounded continuously An individual deposits Rs. 1,000 each year in his account. How much will be in the account after 5 years. ($e^{0.25} = 1.284$)
- The marginal cost function of a product is given by $\frac{dC}{dx} = 100 - 10x + 0.1x^2$ where x is the output. Obtain the total and the average cost function of the firm under the assumption, that its fixed cost is Rs. 500.
- Determine the cost of producing 200 air conditioners if the marginal cost (is per unit) is $C'(x) = \frac{x^2}{200} + 4$
- If the marginal revenue function for a commodity is $MR = 9 - 4x^2$. Find the demand function.
- The marginal cost of production of a firm is given by $C'(x) = 5 + 0.13x$, the marginal revenue is given by $R'(x) = 18$ and the fixed cost is Rs. 120. Find the profit function.
- Find the revenue function and the demand function if the marginal revenue for x units is $MR = 10 + 3x - x^2$.
- If the marginal cost (MC) of a production of the company is directly proportional to the number of units (x) produced, then find the total cost function, when the fixed cost is Rs. 5,000 and the cost of producing 50 units is Rs. 5,625.
- If $MR = 20 - 5x + 3x^2$, find total revenue function.
- Calculate consumer's surplus if the demand function $p = 50 - 2x$ and $x = 20$
- If the supply function for a product is $p = 3x + 5x^2$. Find the producer's surplus when $x = 4$.
- The demand equation for a products is $x = \sqrt{100 - p}$ and the supply equation is $x = \frac{p}{2} - 10$. Determine the consumer's surplus and producer's surplus, under market equilibrium.
- A manufacture's marginal revenue function is given by $MR = 275 - x - 0.3x^2$. Find the increase in the manufactures total revenue if the production is increased from 10 to 20 units.
- For the marginal revenue function $MR = 6 - 3x^2 - x^3$, Find the revenue function and demand function.
- The marginal cost of production of a firm is given by $C'(x) = 20 + \frac{x}{20}$ the marginal revenue is given by $R'(x) = 30$ and the fixed cost is Rs. 100. Find the profit function
- The demand equation for a product is $p_d = 20 - 5$ and the supply equation is $p_s = 4x + 8$. Determine the consumer's surplus and producer's surplus under market equilibrium.
- A company requires $f(x)$ number of hours to produce 500 units. It is represented by $f(x) = 1800x^{-0.4}$. Find out the number of hours required to produce additional 400 units. [$(900)^{0.6}=59.22$, $(500)^{0.6}=41.63$]

- 23) The price elasticity of demand for a commodity is $\frac{p}{x^3}$. Find the demand function if the quantity of demand is 3, when the price is Rs. 2
- 24) Find the area of the region bounded by the curve between the parabola $y = 8x^2 - 4x + 6$ the y-axis and the ordinate at $x = 2$.
- 25) Find the area of the region bounded by the curve $y^2 = 27x^3$ and the lines $x = 0$, $y = 1$ and $y = 2$.

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BM UNIT 3 [IMPORTANR 3 MARKS]

Date : 21-Jun-19

12th Standard 2019 EM

Business Maths

Reg.No. :

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Total Marks : 60

20 x 3 = 60

Time : 01:00:00 Hrs

FOR ANSWERS WHATSAPP - 8056206308

- 1) Find the area bounded by $y = 4x + 3$ with x- axis between the lines $x = 1$ and $x = 4$
- 2) Find the area of the region bounded by the line $x - 2y - 12 = 0$, the y-axis and the lines $y = 2$, $y = 5$.
- 3) Find the area of the region bounded by the parabola $y = 4 - x^2$, x -axis and the lines $x = 0$, $x = 2$
- 4) Find the area bounded by $y = x$ between the lines $x = -1$ and $x = 2$ with x -axis.
- 5) Find the area of the parabola $y^2 = 8x$ bounded by its latus rectum.
- 6) Sketch the graph $y = |x + 3|$ and evaluate $\int_{-6}^0 |x + 3| dx$.
- 7) Using integration find the area of the circle whose center is at the origin and the radius is a units.
- 8) Using integration find the area of the region bounded between the line $x = 4$ and the parabola $y^2 = 16x$.
- 9) The demand function of a commodity is $y = 36 - x^2$. Find the consumer's surplus for $y_0 = 11$
- 10) Find the producer's surplus defined by the supply curve $g(x) = 4x + 8$ when $x_0 = 5$.
- 11) The demand and supply function of a commodity are $p_d = 18 - 2x - x_2$ and $p_s = 2x - 3$. Find the consumer's surplus and producer's surplus at equilibrium price.
- 12) Find the area contained between the x-axis and one arc of the curve $y = \cos x$ bounded between $x = -\frac{\pi}{2}$ and $x = \frac{\pi}{2}$
- 13) Find the area under the demand curve $xy = 1$ bounded by the ordinates $x = 3$, $x = 9$ and x-axis
- 14) Find the area bounded by one arc of the curve $y = \sin ax$ and the x-axis.
- 15) Find the area of the region bounded by the line $y = x - 5$, the x-axis and between the ordinates $x=3$ and $x=7$
- 16) The Marginal revenue for a commodity is $MR = \frac{e^x}{100} + x + x^2$, find the revenue function.
- 17) The elasticity of demand with respect to price for a commodity-is a constant and is equal to 2. Find the demand function and hence the total revenue function, given that when the price is 1, the demand is 4.
- 18) A company determines that the marginal cost of producing x units is $C'(x) = 10.6x$. The fixed cost is Rs. 50. The selling price per unit is Rs.5. Find the profit function.
- 19) Determine the cost of producing 3000 units of commodity if the marginal cost in rupees per unit is $C'(x) = \frac{x}{3000} + 2.50$
- 20) The marginal revenue function is given by $R'(x) = \frac{3}{x^2} - \frac{2}{x}$. Find the revenue function and demand function if $R(1)=6$

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BM UNIT 5 [IMPORTANR 5 MARKS]

Date : 21-Jun-19

12th Standard 2019 EM

Business Maths

Reg.No. :

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Time : 01:30:00 Hrs

Total Marks : 100

FOR ANSWERS WHATSAPP - 8056206308

20 x 5 = 100

- The marginal cost function of manufacturing x shoes is $6 + 10x - 6x^2$. The cost producing a pair of shoes is Rs.12. Find the total and average cost function.
- A company has determined that the marginal cost function for a product of a particular commodity is given by $MC = 125 + 10x - \frac{x^2}{9}$ where C rupees is the cost of producing x units of the commodity. If the fixed cost is Rs.250 what is the cost of producing 15 units.
- The marginal cost function $MC = 2 + 5e^x$
Find C if $C(0)=100$
- The rate of new product is given by $f(x) = 100 - 90e^{-x}$ where x is the number of days the product is on the market. Find the total sale during the first four days. ($e^{-4} = 0.018$)
- A company produces 50,000 units per week with 200 workers. The rate of change of productions with respect to the change in the number of additional labour x is represented as $300 - 5x^{1/2}$ If 64 additional labours are employed, find out the additional number of units, the company can produce.
- The rate of change of sales of a company after an advertisement campaign is represented as, $f(t) = 3000e^{-0.3t}$ where t represents the number of months after the advertisement. Find out the total cumulative sales after 4 months and the sales during the fifth month. Also find out the total sales due to the advertisement campaign [$e^{-1.2} = 0.3012$, $e^{-1.5} = 0.2231$].
- The price of a machine is 6,40,000 if the rate of cost saving is represented by the function $f(t) = 20,000t$. Find out the number of years required to recoup the cost of the function.
- For the marginal revenue function $MR = 35 + 7x - 3x^2$, find the revenue function and demand function.
- A firm has the marginal revenue function given by $MR = \frac{a}{(x+b)^2} - c$ where x is the output and a, b, c are constants. Show that the demand function is given by $x = \frac{a}{b(p+c)} - b$.
- The marginal cost $C'(x)$ and marginal revenue $R'(x)$ are given by $C'(x) = 50 + \frac{x}{50}$ and $R'(x) = 60$. The fixed cost is Rs. 200. Determine the maximum profit
- The marginal cost and marginal revenue with respect to commodity of a firm are given by $C'(x) = 8 + 6x$ and $R'(x) = 24$. Find the total Profit given that the total cost at zero output is zero.
- The marginal revenue function (in thousand of rupees) of a commodity is $10 + e^{-0.05x}$ Where x is the number of units sold. Find the total revenue from the sale of 100 units ($e^{-5} = 0.0067$)
- The price of a machine is Rs. 5,00,000 with an estimated life of 12 years. The estimated salvage value is Rs. 30,000. The machine can be rented at Rs. 72,000 per year. The present value of the rental payment is calculated at 9% interest rate. Find out whether it is advisable to rent the machine. ($e^{-1.08} = 0.3396$).
- A company receives a shipment of 200 cars every 30 days. From experience it is known that the inventory on hand is related to the number of days. Since the last shipment, $I(x)=200 - 0.2x$. Find the daily holding cost for maintaining inventory for 30 days if the daily holding cost is Rs. 3.5
- Mr. Arul invests Rs. 10,000 in ABC Bank each year, which pays an interest of 10% per annum compounded continuously for 5 years. How much amount will there be after 5 years. ($e^{0.5} = 1.6487$)
-

In year 2000 world gold production was 2547 metric tons and it was growing exponentially at the rate of 0.6% per year. If the growth continues at this rate, how many tons of gold will be produced from 2000 to 2013? [$e^{0.078} = 1.0811$]

- 17) When the Elasticity function is $\frac{x}{x-2}$. Find the function when $x = 6$ and $y = 16$.
- 18) The elasticity of demand with respect to price p for a commodity is $\eta_d = \frac{p+2p^2}{100-p-p^2}$. Find demand function where price is Rs. 5 and the demand is 70.
- 19) The marginal cost function $MC = 2 + 5e^x$
Find AC.
- 20) The demand and supply functions under pure competition are $P_d = 16 - x^2$ and $p_s = 2x^2 + 4$. Find the consumer's surplus and producer's surplus at the market equilibrium price.

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