RAVI MATHS TUITION CENTER, NEAR VILLIVAKKAM RLY STATION, CH- 82.
Whatsapp - 8056206308

REDUCED Integral Calculus – II

12th Standard

Business Maths

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Exam Time : 00:01:00 Hrs

50 x 1 = 50

1) 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

2) Area bounded by the curve y = e^{-2x} between the limits 0 ≤ x ≤ ∞ is
(a) 1 sq.units (b) $\frac{1}{2}$ sq.unit (c) 5 sq.units (d) 2 sq.units

3) 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

4) 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) $e^{\frac{-x}{10}}+10$

5) If MR and MC denotes the marginal revenue and marginal cost functions, then the profit functions is
(a) P = ∫(MR − MC) dx + k (b) P = ∫(MR + MC) dx + k (c) P = ∫(MR)(MC)dx + k (d) P = ∫(R −C)dx + k

6) 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

7) 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

8) The given demand and supply function are given byD(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) $\frac{41}{5}$

9) 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

10) The profit of a function p(x) is maximum when
(a) MC − MR = 0 (b) MC = 0 (c) MR = 0 (d) MC + MR = 0

11) 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

12) 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 + $9x^2$

13) 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

14) 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

15) 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

16) 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) η_d (b) -η_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) $\left(1-\frac{1}{e}\right)$ sq.units (d) $\left(1+\frac{1}{e}\right)$ 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

26) The area bounded by $y = 2x - x^2$ and X-axis is _____ sq. units

(a) $\frac{2}{3}$ (b) $\frac{4}{3}$ (c) 2 (d) 4

27) The area of the region bounded by the ellipse

(a) π ab sq.units (b) $\frac{\pi a}{b}$ sq.units (c) 2π ab sq.unit (d) $\frac{\pi}{2}$ ab sq.units

28) The area unded by the curves $y = 2^x$, x = 0 anx=2 is_____sq.units.

(a) $\log_e 2$ (b) $3\log_e 2$ (c) $\frac{3}{log_e 2}$ (d) $2\log_e 3$

29) The area of the region bounded by the line 2y = -x + 8, X - axis and the lines x = 2 and x = 4 is _____ sq.units.

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) 5 (d) $\frac{5}{2}$

30) The area enclosed by the curve $y = \cos^2 x$ in $[0,\pi]$ the lines x=0, x=π and the X-axis is _____sq.units.

(a) 2π (b) 2π (c) $\frac{2}{\pi}$ (d) $\frac{\pi}{2}$

31) The area of the region bounded by the line y = 3x + 2, the X-axis and the ordinates x = - 1 and x = 1is_____ sq. units.

(a) $\frac{13}{3}$ (b) 13 (c) $\frac{26}{3}$ (d) $\frac{3}{13}$

32) The value of $\int_{-3}^{2} |x+1|dx$ is_____.

(a) 4 (b) $\frac{1}{4}$ (c) 8 (d) 2

33) The area lying above the X-axis and under the parabola $y = 4x - x^2$ is _____ sq. units

(a) $\frac{16}{3}$ (b) $\frac{8}{3}$ (c) $\frac{32}{3}$ (d) $\frac{64}{3}$

34) The area of the region bounded by the curve $y^2 = 2y - x$ and the y-axis _____ sq. units

(c) 4

(a) $\frac{4}{3}$ (b) $\frac{2}{3}$ (d) $\frac{16}{3}$

35) The area bounded by the curve y = 4ax and the lines y^2 = 2a and Y-axis is _____ sq. units.

(a) $\frac{2a}{3}$ (b) $2a^2$ (c) $\frac{a^2}{3}$ (d) $\frac{2a^2}{3}$

36) If the marginal cost function MC = 2 - 4x, then the cost function is

(a) $2x- 2X^2+ k$ (b) $2-4x^2$ (c) $\frac{2}{x} - 4$ (d) $2x-4x^2$

37) If MR = 15 - 8x, then the revenue function is

(a) $15x-4x^2+k$ (b) $\frac{15}{x} - 8$ (c) -8 (d) 15x-8

38) If R' (x) = $\frac{1}{x+1}$, then the revenue function is

(a) log|x+1|+k (b) $\frac{-1}{x+1}$ (c) $\frac{1}{(x+1)^2}$ (d) $\log \frac{1}{x+1}$

39) The Consumer's surplus for the demand function P =f(x) for the quantity X_o and price P_o is

(a) $\int_0^{x0} f(x)dx - p_0x_0$ (b) $\int_0^{x0} f(x)dx$ (c) $p_0x_0-\int_0^{x0} g(x)dx$ (d) $\int_0^{p0} f(x)dx$

40) The Producer's surplus for the supply function P = g(x) for the quantity X_o and price P_o is

(a) $\int_0^{x0} g(x)dx - p_0x_0$ (b) $p_0x_0 - \int_0^{x0} g(x)dx$ (c) $\int_0^{x0} g(x)dx$ (d) $\int_0^{p0} g(x)dx$

41) The area under the curve y =f (x), the X-axis and the ordinates at x = a and x = b is_____.

(a) $\int_a^b ydx$ (b) $\int_a^b ydy$ (c) $\int_a^b xdy$ (d) $\int_a^b ydx$

42) The area under the curve x = g(y), the Y-axis and the lines y = c and y = d is_____.

(a) $\int_c^d ydy$ (b) $\int_c^d xdy$ (c) $\int_c^d ydx$ (d) $\int_c^d xdx$

43) The area bounded by the curve $y = e^x$, the X-axis and the lines x = 0 and x = 2 is_____.

(a) e^2-1 (b) e^2+1 (c) e^2 (d) e^2-2

44) The area bounded by y = x, the Y-axis and y= 1is_____.

(a) 1 (b) $\frac{1}{2}$ (c) log 2 (d) 2

45) The area of the region bounded by y = x + 1, the X-axis and the lines x = 0,x = 1 is_____.

(a) $\frac{1}{2}$ (b) 2 (c) $\frac{3}{2}$ (d) 1

46) The are bounded by the demand curve xy = 1, the X-axis, x = 1 and x = 2 is _____

(a) log 2 (b) $\log \frac{1}{2}$ (c) 2 log 2 (d) $\frac{1}{2}$ log 2

47) The area above the supply curve p = g(x) and below the line p =P_o is _____.

(a) Producer's Surplus (b) Consumer's Surplus (c) $\int_0^{p0} g(x)dx$ (d) $\int_0^{x0} g(x)dx$

48) The area below the demand curve p =f(x) and above the line p =P_o is_____.

(a) Producer's Surplus (b) Consumer's Surplus (c) $\int_0^{p0} g(x)dx$ (d) $\int_0^{x0} g(x)dx$

49) Profit = Total revenue - _____.

(a) demand (b) total cost (c) Marginal cost (d) Average cost

50) Profit function is maximum when $\frac{dp}{dx}$ =0 and $\frac{d^2p}{dx^2}$ is _____.

(a) positive (b) negative (c) 0 (d) maximum

17 x 2 = 34

51) Find the area of the region bounded by the line x − 2y − 12 = 0 , the y-axis and the lines y = 2, y = 5.
52) Find the area of the region bounded by the parabola $y = 4-x^2$, x −axis and the lines x = 0, x = 2
53) Using Integration, find the area of the region bounded the line 2y + x = 8, the x axis and the lines x = 2, x = 4.
54) Find the area bounded by the lines y − 2x − 4 = 0, y = 1, y = 3 and the y-axis
55) If MR = 20 − 5x + $3x^2$, find total revenue function.
56) If MR = 14 − 6x + $9x^2$, find the demand function.
57) For the marginal revenue function MR = 6 − $3x^2$ − x^3 , Find the revenue function and demand function.
58) Find the area of the region bounded by the parabola x^2 = 4y, Y = 2, Y = 4 and the y-axis.
59) Find the area under the curve y = $4x^2$ - 8x + 6 bounded by the Y-axis, X-axis and the ordinate at x = 2.
60) Find the area under the curve y = 4x - x^2 included between x = 0, x = 3 and the X-axis.
61) The marginal cost function of manufacturing x units of a commodity is $3x^2$ - 2x + 8. If there is no fixed cost, find the total cost function?
62) If the marginal revenue for a commodity is MR = 9 - $6x^2$ + 2x, find the total revenue function.
63) The marginal cost at a production level of x units is given by C '(x) = 85+ $\frac{375}{x^2}$. Find the cost of producing 10 in elemental units after 15 units have been produced?
64) The marginal cost function is MC= $\frac{100}{x}$. Find the cost function C(x)if C(16)=100.
65) Find the demand function for which the elasticity of demand is 1
66) Find the consumer's surplus for the demand function p = 25 - x -x^2 when P_o = 19
67) Find the producer's surplus for the supply function p =r +x^2 + 3 when x_o =4

68) Find the area bounded by y = x between the lines x = −1 and x = 2 with x - axis.
69) Find the area bounded by the line y = x, the x-axis and the ordinates x = 1, x = 2
70) 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.
71) 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
72) 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.
73) 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.
74) The marginal cost function MC = 2 + $5e^x$ Find C if C (0)=100
75) The rate of new product is given by f (x) = 100 − 90 e^{-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)
76) 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.

77) The price of a machine is 6,40,000 if the rate of cost saving is represented by the function f(t) = 20,000 t. Find out the number of years required to recoup the cost of the function.

78) For the marginal revenue function MR = 35 + 7x − $3x^2$, find the revenue function and demand function.

79) 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

80) 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)

81) 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.

82) 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)

83) A company receives a shipment of 500 scooters every 30 days. From experience it is known that the inventory on hand is related to the number of days x. Since the shipment, I (x) = 500 − $0.03x^2$, the daily holding cost per scooter is Rs. 0.3. Determine the total cost for maintaining inventory for 30 days.

84) 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.

85) The marginal cost function is MC = 300 $x^{\frac{2}{5}}$ and fixed cost is zero. Find out the total cost and average cost functions.

86) If the marginal cost function of x units of output is $\frac{a}{\sqrt{ax+b}}$ and if the cost of output is zero. Find the total cost as a function of x.

87) Determine the cost of producing 200 air conditioners if the marginal cost (is per unit) is C' (x) = $\frac{x^2}{200}$ + 4

88) The marginal revenue (in thousands of Rupees) functions for a particular commodity is 5 + 3 $^{-0\ 03}$ e . x where x denotes the number of units sold. Determine the total revenue the sale of 100 units. (Given e^{-3} = 0.05 approximately)

89) If the marginal revenue function for a commodity is MR = 9 − $4x^2$. Find the demand function.

90) Given the marginal revenue function $\frac{4}{(2x+3)^2}$ -1, show that the average revenue function is P = $\frac{4}{6x+9}$ -1

91) If the marginal revenue function is R'(x)= 1500 − 4x − $3x^2$. Find the revenue function and average revenue function.

92) Find the revenue function and the demand function if the marginal revenue for x units is MR= 10 + 3x − x^2.

93) The marginal cost function of a commodity is given by MC = $\frac{14000}{\sqrt{7x+4}}$ and the fixed cost is Rs.18,000.Find the total cost and average cost.

94) The demand function of a commodity is y = 36 − x^2. Find the consumer's surplus for y_0 = 11

95) Find the producer's surplus defined by the supply curve g(x) = 4x + 8 when x_o= 5.

96) 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.

97) Calculate consumer's surplus if the demand function $p = 50 - 2x$ and $x = 20$

98) Calculate consumer's surplus if the demand function $p = 122 - 5x - 2x^2$ and $x = 6$

99) The demand function $p = 85 - 5x$ and supply function $p = 3x - 35$. Calculate the equilibrium price and quantity demanded .Also calculate consumer's surplus.

100) The demand function for a commodity is $p = e^{-x}$ .Find the consumer's surplus when $p = 0.5$.

101) Calculate the producer's surplus at $x = 5$ for the supply function $p = 7 + x$.

102) If the supply function for a product is $p = 3x + 5x^2$. Find the producer's surplus when $x = 4$.

103) The demand function for a commodity is $p = \frac{36}{x+4}$. Find the consumer's surplus when the prevailing market price is Rs. 6.

104) The demand and supply functions under perfect competition are $p_d = 1600 - x^2$ and $p_s = 2x^2 + 400$ respectively. Find the producer's surplus.

105) 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.

106) A company has determined that marginal cost function for x product of a particular commodity is given by $MC = 125 + 10x - \frac{x^2}{9}$. Where C is the cost of producing x units of the commodity. If the fixed cost is rs. 250 what is cost of producing 15 units

107) The marginal revenue function for a firm is given by $MR = \frac{2}{x+3} - \frac{2x}{(x+3)^2} + 5$. Show that the demand function is $P = \frac{2x}{(x+3)^2} + 5$

108) 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

109) 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 $x = 2$.

110) Find the area of the region bounded by the curve $y^2 = 27x^3$ and the lines $x = 0$, $y = 1$ and $y = 2$.

111) The marginal cost function $MC = 2 + 5e^x$ Find AC.

112) Find the area contained between the x-axis and one arc of the curve $y = \cos x$ bounded between $x = -\frac{\pi}{2} and \quad x = \frac{\pi}{2}$

113) Find the area under the demand curve $xy = 1$ bounded by the ordinates $x = 3$, $x = 9$ and x-axis

114) Find the area bounded by one arc of the curve $y = \sin ax$ and the x-axis.

115) Find the area of the region bounded by the line $x - y = 1$, x-axis and the lines $x = -2$ and $x = 0$.

x-y=1

x	0	1
y	-1	0

116) Determine the cost of producing 3000 units of commodity if the marginal cost in rupees per unit is $C'(x) = \frac{x}{3000} + 2.50$

117) 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

41 x 5 = 205

118) Find the area bounded by $y = 4x + 3$ with x- axis between the lines $x = 1$ and $x = 4$

119) Find the area of the parabola $y^2 = 8x$ bounded by its latus rectum.

120) Sketch the graph $y = |x + 3|$ and evaluate $\int_{-6}^{0} |x + 3|$ dx.

121) Using integration find the area of the circle whose center is at the origin and the radius is a units.

122) Using integration find the area of the region bounded between the line x = 4 and the parabola $y^2 = 16x$.

123) Calculate the area bounded by the parabola $y^2 = 4ax$ and its latusrectum.

124) Find the area bounded by the curve $y = x^2$ and the line y = 4

125) 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 [$e^{-1.2} = 0.3012$, $e^{-1.5} = 0.2231$].

126) 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 $x = \frac{a}{b(p+c)} - b$.

127) 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

128) 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.

129) 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 ($e^{-5} = 0.0067$)

130) 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.($e^{-1.08} = 0.3396$).

131) 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 = $\frac{3}{8}$

132) 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.

133) When the Elasticity function is $\frac{x}{x-2}$. Find the function when x = 6 and y = 16.

134) 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.

135) 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.($e^{0.25} = 1.284$)

136) A firm's marginal revenue function is MR = $20e^{-x/10}\left(1 - \frac{x}{10}\right)$. Find the corresponding demand function.

137) 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.

138) 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.

139) Under perfect competition for a commodity the demand and supply laws are $P_d = \frac{8}{x+1} - 2$ and $P_s = \frac{x-3}{2}$ respectively. Find the consumer's and producer's surplus.

140) 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.

141) Find the consumer's surplus and producer's surplus for the demand function $p_d = 25 - 3x$ and supply function $p_s = 5 + 2x$.

142) 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

143) The demand equation for a product is $p_d = 20 - 5x$ and the supply equation is $p_s = 4x + 8$. Determine the consumer's surplus and producer's surplus under market equilibrium.

144) 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]

145) Find the area of the region bounded by the line y = x - 5, the x-axis and between the ordinates x=3and x=7

146) The Marginal revenue for a commodity is MR= $\frac{e^x}{100} + x + x^2$, find the revenue function.

147) 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.

148) 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.

149) 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.

150) The demand and supply curves are given by $P_d = \frac{16}{x+4}$ and $P_s = \frac{x}{2}$. Find the Consumer's surplus and producer's surplus at the market equilibrium price.

151) The marginal cost C' (x) and marginal revenue R' (x) are given by C' (x) = 20 + $\frac{x}{20}$ and R' (x) = 30. The fixed cost is Rs.200. Determine the maximum profit.

152) The marginal revenue function (in thousands of rupees) of a commodity is $7+e^{-0.05x}$ where x is the number of units sold. Find the total revenue from the sale of 100 units (e^{-5} = 0.0067)

153) The elasticity of demand with respect to price P for a commodity is $\frac{x-5}{x}$,x > 5, When the demand is x. Find demand function if the price is 2 when the demand is 7. Also, find the revenue function.

154) The marginal cost function of a commodity in a firm is $2 + e^{3x}$ where X is the output. Find the total cost and average cost function if the fixed cost is Rs. 500.

155) Find the area of the region bounded by the curve $y = 3x^2 - x$, X-axis and the lines between x=-1 andx= 1

156) Find the area of the region bounded by the parabola $y^2 = 4x$ and the line 2x - Y = 4.

157) Find the area bounded by the curve y = sin x between x = 0 and x = 2π

158) Sketch the graph of y = Ix - 5|. Evaluate $\int_0^1 |4x - 5| dx$

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