

15.07.2019

Special Test-Business Maths

Time: 2½ hrs

STD: XII (F,G,H)

Marks: 100

I. Choose the correct answer:

25x1=25

1.  $\int \frac{1}{x^3}.dx$  is \_\_\_\_\_

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

2.  $\int \frac{\log x}{x}.dx$ ,  $x>0$  is \_\_\_\_\_

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

3.  $\int e^{2x} [2x^2 + 2x].dx=$ \_\_\_\_\_

- a)  $e^{2x}.x^2+c$     b)  $x.e^{2x}+c$     c)  $2x^2 e^{2+c}$     d)  $\frac{x^2 e^x}{2}+c$

4.  $\int_0^1 (2x + 1).dx$  is \_\_\_\_\_

- a) 1    b) 2    c) 3    d) 4

5.  $\int_{-1}^1 x^3 . e^{x^4} .dx$  is \_\_\_\_\_

- a) 1    b)  $2\int_0^1 x^3 . e^{x^4} .dx$     c) 0    d)  $e^{x^4}$

6.  $\int_0^{\frac{\pi}{3}} \tan x . dx$  is \_\_\_\_\_

- a)  $\log 2$     b) 0    c)  $\log\sqrt{2}$     d)  $2 \log 2$

7.  $\gamma(1)$  is \_\_\_\_\_

- a) 0    b) 1    c) n    d) n!

8.  $\gamma(n)$  is \_\_\_\_\_

- a)  $(n-1)!$     b) n!    c)  $n \gamma(n)$     d)  $(n-1) \gamma(n)$

9.  $\int_0^{\infty} x^4 . e^{-x} .dx$  is \_\_\_\_\_

- a) 12    b) 4    c) 4!    d) 64

10. The value of  $\int_{\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x .dx$  is \_\_\_\_\_

- a) 0    b) 1    c) 2    d) 4

11. If  $f(x)$  is an even function, then  $\int_{-a}^a f(x).dx=$ \_\_\_\_\_

- a) 0    b)  $2 \int_0^a f(x).dx$     c) 1    d)  $\int_0^a f(x).dx$

12.  $e^{a \log x}=$  \_\_\_\_\_

- a)  $a^x$     b)  $x^a$     c)  $\log x$     d)  $\log a$

13.  $\int \frac{1}{x-5}.dx=$  \_\_\_\_\_

- a)  $\frac{-1}{(x-5)^2}$     b)  $\log|x - 5|$     c)  $-(x-5)^2$     d)  $\frac{1}{x-5}$

14. Average Revenue is also called as \_\_\_\_\_ function.

- a) Cost    b) Revenue    c) Profit    d) Demand

15. Area bounded by the curve  $y=e^{-2x}$  between the limits  $0 \leq x \leq \infty$  is \_\_\_\_\_ sq.units.

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

16. The demand & supply functions are given by  $D(x)=16-x^2$  &  $S(x)=2x^2+4$  are under perfect competition then the equilibrium price  $x$  is \_\_\_\_\_.

- a) 2    b) 3    c) 4    d) 5

17. The profit of a function  $p(x)$  is maximum when \_\_\_\_\_.

- a)  $MC-MR=0$     b)  $MC=0$     c)  $MR=0$     d)  $MC+MR=0$

18. When  $x_0=2$ ,  $P_0=12$  the producers' surplus for the supply function  $Ps=2x^2+4$  is \_\_\_\_\_ units.

- a)  $\frac{31}{5}$     b)  $\frac{31}{2}$     c)  $\frac{32}{3}$     d)  $\frac{30}{7}$

19. Area bounded by  $y=x$  between the lines  $y=1$ ,  $y=2$  with  $y$ -axis is \_\_\_\_\_ sq.units.

- a)  $\frac{1}{2}$     b)  $\frac{5}{2}$     c)  $\frac{3}{2}$     d) 1

20.  $MC=100\sqrt{x}$ . Find AC given that  $TC=0$  when the output is zero is

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

21. For a demand function P, if  $\int \frac{dP}{P} = k \int \frac{dx}{x}$  then k \_\_\_\_\_.

- a)  $\eta_d$       b)  $-\eta_d$       c)  $\frac{-1}{\eta_d}$       d)  $\frac{1}{\eta_d}$

22. Area bounded by  $y=|x|$  between the limits 0 & 2 is \_\_\_\_\_ sq.units.

- a) 1      b) 3      c) 2      d) 4

23. 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)  $100+9x^2$

24. If  $p=50-2x$ ,  $x=20$  then the price is \_\_\_\_\_.

- a) 20      b) 10      c) 40      d) 30

25. At market equilibrium, \_\_\_\_\_.

- a)  $P_d=P_s$       b)  $P_d<P_s$       c)  $P_d>P_s$       d)  $P_d \neq P_s$

II. Answer for any 7 of the following:

$$7x^2=14$$

26. Find the area bounded by  $y=4x+3$  with x-axis between the lines  $x=1$  &  $x=4$ .

27. The marginal cost function,  $MC=2+5.e^x$ . Find 'c' if  $c(0)=100$ .

28. If  $MR=14-6x+9x^2$ , find the demand function.

29. Find the area bounded by the lines  $y-2x-4=0$ ,  $y=1$ ,  $y=3$  & the y-axis.

30. If the demand function  $P=122-5x-2x^2$  and  $x=6$  then find the price

31. Evaluate  $\int \frac{x}{x^2+1}.dx$

32. Evaluate  $\int \frac{1}{\sqrt{x^2+6x+13}}.dx$

33. Evaluate  $\int_1^2 \frac{1}{(x+1)(x+2)}.dx$

34. Evaluate  $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin x.dx$

35. Evaluate  $\int_0^{\infty} e^{-4x}.x^4.dx$

III. Answer for any 7 of the following:

$$7x^3=21$$

36. Evaluate  $\int_1^4 f(x).dx$  where  $f(x)=\begin{cases} 7x+3; & 1 \leq x \leq 3 \\ 8x & ; 3 \leq x \leq 4 \end{cases}$

37. Evaluate  $\int \frac{x^3.dx}{\sqrt{x^8+1}}$

38. Evaluate  $\int e^x \left[ \frac{1}{x^2} - \frac{2}{x^3} \right].dx$

39. If  $f(x)=x+b$ ,  $f(1)=5$  &  $f(2)=13$ , then find  $f(x)$ .

40. Evaluate  $\int_1^e \log x.dx$

41. Find the area bounded by the parabola  $y^2=4ax$  & its latus rectum

42. Find the revenue function and the demand function if the  $MR=10+3x-x^2$ .

43. Determine the cost of producing 200 Air Condition if the MC,  $C'(x)=\frac{x^2}{200}+4$

44. The demand function for a commodity is  $p=e^{-x}$ . Find the consumers' surplus when  $p=0.5$

45. The demand and supply functions under perfect competition are  $P_d=1600-x^2$  &  $P_s=2x^2+400$  then find the value of  $x$  &  $p$ .

IV. Answer for any 8 of the following:

$$8x^5=40$$

46. Find the consumer's & producer's surplus for the demand function  $P_d=25-3x$  & supply function  $P_s=5+2x$ .

47. The MC of production of a firm is given by  $C'(x)=5+0.13x$ , the MR is given by  $R'(x)=18$  & the fixed cost is Rs.120. Find the profit function.

48. The elasticity of demand w.r.t price 'p' for a commodity is  $\eta_d = \frac{p+2p^2}{100-p-p^2}$  Find demand function where price is Rs.5 & the demand is 70.

49. Find the area bounded by the curve  $y=x^2$  & the line  $y=4$ .

50. Find the consumer's surplus & producers' surplus if the demand & supply function of a commodity are  $P_d=18-2x-x^2$  &  $P_s=2x-3$ .

51. Evaluate  $\int x^5 . e^{x^2}.dx$

52. Evaluate  $\int_2^5 \frac{\sqrt{x}}{\sqrt{x}+\sqrt{7-x}}.dx$

53. Evaluate the integral as the limit of a sum  $\int_1^2 x^2.dx$

54. Evaluate  $\int_0^1 [e^{a \log x} + e^{x \log a}].dx$

55. Evaluate  $\int \frac{1}{x(x^3+1)}.dx$

56. The M.C & M.R with respect to commodity of a firm are given by  $C'(x)=8+6x$  &  $R(x)=24$ . Find the total profit given that the total cost at zero output is zero.