

## **+2 BUSINESS MATHEMATICS AND STATISTICS**

# **CHAPTERWISE ONE MARK QUESTIONS 2023**

## **CH: 1,2,3,4,5**

## CHAPTER 1: APPLICATIONS OF MATRICES AND DETERMINANTS

## **Choose then correct answer**



23) If  $\frac{a_1}{x} + \frac{b_1}{y} = c_1, \frac{a_2}{x} + \frac{b_2}{y} = c_2, \Delta_1 = \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}; \Delta_2 = \begin{vmatrix} b_1 & c_1 \\ b_2 & c_2 \end{vmatrix}, \Delta_3 = \begin{vmatrix} c_1 & a_1 \\ c_2 & a_2 \end{vmatrix}$  then (x,y) is

- (a)  $\left(\frac{\Delta_2}{\Delta_1}, \frac{\Delta_3}{\Delta_1}\right)$  (b)  $\left(\frac{\Delta_3}{\Delta_1}, \frac{\Delta_2}{\Delta_1}\right)$  (c)  $\left(\frac{\Delta_1}{\Delta_2}, \frac{\Delta_1}{\Delta_3}\right)$  (d)  $\left(\frac{-\Delta_1}{\Delta_2}, \frac{-\Delta_1}{\Delta_3}\right)$

24)  $|A_{n \times n}| = 3 |adj A| = 243$  then the value n is

- (a) 4 (b) 5 (c) 6 (d) 7

25) Rank of a null matrix is

- (a) 0 (b) -1 (c)  $\infty$  (d) 21

## CHAPTER:2 INTEGRAL CALCULUS - I

Choose the correct answer:

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)  $\int 2^x dx$  is

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

3)  $\int \frac{\sin 2x}{2 \sin x} dx$  is

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

4)  $\int \frac{\sin 5x - \sin x}{\cos 3x} dx$  is

- (a)  $-\cos 2x + c$  (b)  $-\cos 2x + c$  (c)  $-\frac{1}{4} \cos 2x + c$  (d)  $-4 \cos 2x + c$

5)  $\int \frac{\log x}{x} dx, x > 0$  is

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

6)  $\int \frac{e^x}{\sqrt{1+e^x}} dx$

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

7)  $\int \sqrt{e^x} dx$  is

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

8)  $\int e^{2x} [2x^2 + 2x] dx$

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

9)  $\int \frac{e^x}{e^{x+1}} dx$  is

- (a)  $\log \left| \frac{e^x}{e^{x+1}} \right| + c$  (b)  $\log \left| \frac{e^{x+1}}{e^x} \right| + c$  (c)  $\log |e^x| + c$  (d)  $\log |e^x + 1| + c$

10)  $\int \left[ \frac{9}{x-3} - \frac{1}{x+1} \right] dx$  is

- (a)  $\log|x-3| - \log|x+1| + c$  (b)  $\log|x-3| + \log|x+1| + c$   
 (c)  $9 \log|x-3| - \log|x+1| + c$  (d)  $9 \log|x-3| - \log|x+1| + c$

11)  $\int \frac{2x^3}{4+x^4} dx$  is

- (a)  $\log|4+x^4| + c$  (b)  $\frac{1}{2} \log|4+x^4| + c$  (c)  $\frac{1}{4} \log|4+x^4| + c$  (d)  $\log \left| \frac{2x^3}{4+x^4} \right| + c$

- 12)  $\int \frac{dx}{\sqrt{x^2 - 36}}$  is  
 (a)  $\sqrt{x^2 - 36} + c$   
 (c)  $\log|x - \sqrt{x^2 - 36}| + c$   
 (b)  $\log|x + \sqrt{x^2 - 36}| + c$   
 (d)  $\log|x^2 + \sqrt{x^2 - 36}| + c$
- 13)  $\int \frac{2x+3}{\sqrt{x^2+3x+2}} dx$  is  
 (a)  $\sqrt{x^2 + 3x + 2} + c$   
 (b)  $2\sqrt{x^2 + 3x + 2} + c$   
 (c)  $\log(x^2 + 3x + 2) + c$   
 (d)  $\frac{2}{3}(x^2 + 3x + 2)^{\frac{3}{2}}$
- 14)  $\int_0^1 (2x + 1) dx$  is  
 (a) 1  
 (b) 2  
 (c) 3  
 (d) 4
- 15)  $\int_2^4 \frac{dx}{x}$   
 (a)  $\log 4$   
 (b) 0  
 (c)  $\log 2$   
 (d)  $\log 8$
- 16)  $\int_0^\infty e^{-2x} dx$   
 (a) 0  
 (b) 1  
 (c) 2  
 (d)  $\frac{1}{2}$
- 17)  $\int_{-1}^1 x^3 e^{x^4} dx$  is  
 (a) 1  
 (b)  $2 \int_0^1 x^3 e^{x^4} dx$   
 (c) 0  
 (d)  $e^{x^4}$
- 18) If  $f(x)$  is a continuous function and  $a < c < b$ , then  $\int_a^c f(x) dx + \int_c^b f(x) dx$  is  
 (a)  $\int_a^b f(x) dx - \int_a^c f(x) dx$   
 (b)  $\int_a^c f(x) dx - \int_a^b f(x) dx$   
 (c)  $\int_a^b f(x) dx$   
 (d) 0
- 19) The value of  $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x dx$  is  
 (a) 0  
 (b) 2  
 (c) 1  
 (d) 4
- 20)  $\int_0^1 \sqrt{x^4(1-x)^2} dx$  is  
 (a)  $\frac{1}{12}$   
 (b)  $-\frac{7}{12}$   
 (c)  $\frac{7}{12}$   
 (d)  $-\frac{1}{12}$
- 21) If  $\int_0^1 f(x) dx = 1$ ,  $\int_0^1 xf(x) dx = a$  and  $\int_0^1 x^2 f(x) dx = a^2$  then  $\int_0^1 (a-x)^2 f(x) dx$  is  
 (a)  $4a^2$   
 (b) 0  
 (c)  $2a^2$   
 (d) 1
- 22) The value of  $\int_2^3 f(5-x) dx - \int_2^3 f(x) dx$  is  
 (a) 1  
 (b) 0  
 (c) -1  
 (d) 5
- 23)  $\int_0^4 \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right) dx$   
 (a)  $\frac{20}{3}$   
 (b)  $\frac{21}{3}$   
 (c)  $\frac{28}{3}$   
 (d)  $\frac{1}{3}$
- 24)  $\int_0^{\frac{\pi}{2}} \tan x dx$  is  
 (a)  $\log 2$   
 (b) 0  
 (c)  $\log \sqrt{2}$   
 (d)  $2 \log 2$
- 25) Using the factorial representation of the gamma function, which of the following is the solution for the gamma function  $\Gamma(n)$  when  $n = 8$   
 (a) 5040  
 (b) 5400  
 (c) 4500  
 (d) 5540
- 26)  $\Gamma(n)$  is  
 (a)  $(n-1)!$   
 (b)  $n!$   
 (c)  $n \Gamma(n)$   
 (d)  $(n-1) \Gamma(n)$
- 27)  $\Gamma(1)$  is  
 (a) 0  
 (b) 1  
 (c) n  
 (d) n!
- 28) If  $n > 0$ , then  $\Gamma(n)$  is  
 (a)  $\int_0^1 e^{-x} x^{n-1} dx$   
 (b)  $\int_0^1 e^{-x} x^n dx$   
 (c)  $\int_0^\infty e^x x^{-n} dx$   
 (d)  $\int_0^\infty e^{-x} x^{n-1} dx$

29)  $\Gamma\left(\frac{3}{2}\right)$

(a)  $\sqrt{\pi}$

(b)  $\frac{\sqrt{\pi}}{2}$

(c)  $2\sqrt{\pi}$

(d)  $\frac{3}{2}$

30)  $\int_0^{\infty} x^4 e^{-x} dx$  is

(a) 12

(b) 4

(c) 4!

(d) 64

### CHAPTER 03 INTEGRAL CALCULUS - II

Choose the best answer from the given alternatives

- 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)  $\frac{31}{2}$  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  $0 \leq x \leq \infty$  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)  $\log 2$  sq.units      (b)  $\log 5$  sq.units      (c)  $\log 3$  sq.units      (d)  $\log 4$  sq.units
- 4) If the marginal revenue function of a firm is  $MR = y = e^{-\frac{x}{10}}$ , 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)  $P = \int (MR - MC)dx + k$       (b)  $P = \int (MR + MC)dx + k$   
 (c)  $P = \int (MR)(MC)dx + k$       (d)  $P = \int (R - C)dx + k$
- 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 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)  $\frac{41}{5}$
- 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)  $35 + \frac{7x}{2} - x^2$       (c)  $35 + \frac{7x}{2} + x^2$       (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  $x_o = 5$  and  $p_o = 3$  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  $x_o = 2$  and  $p_o = 12$  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  $x_o = 3$  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 output 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  $x_o$  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  $P_o$  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)  $\eta_d$       (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)  $\left(1 - \frac{1}{e}\right)$  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

CHAPTER 04 DIFFERENTIAL EQUATIONS

## Choose the Correct answer

- 16) The particular integral of the differential equation  $f(D)y = e^{ax}$  where  $f(D) = (D - a)^2$
- (a)  $\frac{x^2}{2}e^{ax}$       (b)  $xe^{ax}$       (c)  $\frac{x}{2}e^{ax}$       (d)  $x^2e^{ax}$
- 17) The differential equation of  $x^2 + y^2 = a^2$
- (a)  $xdy + ydx = 0$       (b)  $ydx - xdy = 0$       (c)  $x dx - y dy = 0$       (d)  $x dx + y dy = 0$
- 18) The complementary function of  $\frac{d^2y}{dx^2} - \frac{dy}{dx} = 0$  is
- (a)  $A + Be^x$       (b)  $(A + B)e^x$       (c)  $(Ax + B)e^x$       (d)  $Ae^x + B$
- 19) The P.I of  $(3D^2 + D - 14)y = 13e^{2x}$  is
- (a)  $\frac{x}{2}e^{2x}$       (b)  $xe^{2x}$       (c)  $\frac{x^2}{2}e^{2x}$       (d)  $13xe^{2x}$
- 20) The general solution of the differential equation  $\frac{dy}{dx} = \cos x$  is
- (a)  $y = \sin x + 1$       (b)  $y = \sin x - 2$   
 (c)  $y = \cos x + c$ ,  $c$  is an arbitrary constant      (d)  $y = \sin x + c$ ,  $c$  is an arbitrary constant
- 21) A homogeneous differential equation of the form  $\frac{dy}{dx} = f\left(\frac{y}{x}\right)$  can be solved by making substitution,
- (a)  $y = v x$       (b)  $v = y x$       (c)  $x = v y$       (d)  $x = v$
- 22) A homogeneous differential equation of the form  $\frac{dx}{dy} = f\left(\frac{x}{y}\right)$  can be solved by making substitution,
- (a)  $x = v y$       (b)  $y = v x$       (c)  $y = v$       (d)  $x = v$
- 23) The variable separable form of  $\frac{dy}{dx} = \frac{y(x-y)}{x(x+y)}$  by taking  $y = vx$  and  $\frac{dy}{dx} = v + x \frac{dv}{dx}$  is
- (a)  $\frac{2v^2}{1+v} dv = \frac{dx}{x}$       (b)  $\frac{2v^2}{1+v} dv = -\frac{dx}{x}$       (c)  $\frac{2v^2}{1-v} dv = \frac{dx}{x}$       (d)  $\frac{1+v}{2v^2} dv = -\frac{dx}{x}$
- 24) Which of the following is the homogeneous differential equation?
- (a)  $(3x - 5) dx = (4y - 1) dy$       (b)  $xy dx - (x^3 + y^3) dy = 0$   
 (c)  $y^2 dx + (x^2 - xy - y^2) dy = 0$       (d)  $(x^2 + y) dx = (y^2 + x) dy$
- 25) The solution of the differential equation  $\frac{dy}{dx} = \frac{y}{x} + \frac{f\left(\frac{y}{x}\right)}{f'\left(\frac{y}{x}\right)}$  is
- (a)  $f\left(\frac{y}{x}\right) = kx$       (b)  $xf\left(\frac{y}{x}\right) = k$       (c)  $f\left(\frac{y}{x}\right) = ky$       (d)  $yf\left(\frac{y}{x}\right) = k$

## CHAPTER 05 NUMERICAL METHODS

Choose the correct Answer

- 1)  $\Delta^2 y_0 =$
- (a)  $y_2 - 2y_1 + y_0$       (b)  $y_2 + 2y_1 - y_0$       (c)  $y_2 + 2y_1 + y_0$       (d)  $y_2 + y_1 + 2y_0$
- 2)  $\Delta f(x) =$
- (a)  $f(x+h)$       (b)  $f(x) - f(x+h)$       (c)  $f(x+h) - f(x)$       (d)  $f(x) - f(x-h)$
- 3)  $E \equiv$
- (a)  $1 + \Delta$       (b)  $1 - \Delta$       (c)  $1 + \nabla$       (d)  $1 - \nabla$
- 4) If  $h = 1$ , then  $\Delta(x^2) =$
- (a)  $2x$       (b)  $2x - 1$       (c)  $2x + 1$       (d)  $1$

x	5	6	9	11
y	12	13	15	18

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