BRAINWARE UNIVERSITY

Term End Examination 2022
Programme – B.Sc.(Ag)-Hons-2021/B.Sc.(Ag)-Hons-2022
Course Name – Elementary Mathematics
Course Code - RC-BAG102A/RC-BAG102-A
(Semester I)

Full Marks : 50 **Time : 2:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 20=20

1. *Choose the correct alternative from the following :*

(i) The equation of the circle having centre at origin and radius 4 is, select the correct option

a) $x^2 + y^2 = 12$ b) $x^2 + y^2 = 16$
c) $x^2 + y^2 = 4$ d) None of these

(ii) The slope and intercept on y axis in the straight line $y + x = 0$ is, select the correct option.

a) 1,0 b) -1,1
c) -1,0 d) 2,1

(iii) Identify the point (4, -6) lies in

a) 1^{st} quadrant b) 2^{nd} quadrant
c) 3^{rd} quadrant d) 4^{th} quadrant

(iv) Identify the point (-2, $1-\sqrt{3}$) lies in

a) 1^{st} quadrant b) 2^{nd} quadrant
c) 3^{rd} quadrant d) 4^{th} quadrant

(v) Select the correct option, the distance between two points (-2,5) and (2,2) is

a) 1 b) 2
c) 5 d) 25

(vi) Which of the following equation is a circle, Select correct one

a) $x^2 + y^2 - 6x + 4y = 0$ b) $2x^2 + y^2 - 6x + 4y = 0$
c) $x^2 + 2y^2 - 6x + 4y = 0$ d) $3x^2 + 2y^2 - 6x + 4y = 0$

(vii) Tell the polar co-ordinate of the point whose cartesian co-ordinate are (-1, 1) are

a) b)

a) $\left(\sqrt{2}, \frac{3\pi}{4}\right)$ b) $\left(\sqrt{2}, -\frac{3\pi}{4}\right)$

c) $\left(\sqrt{2}, \frac{\pi}{4}\right)$ d) None of these

(viii) solve the $\lim_{x\to 0} \frac{a^x - 1}{x}$

a) $\log_e 3$ b) $\log_e 35$

c) $\log_e a$ d) None of these

(ix) Relate to the correct option, the function $f(x) = \frac{1+x}{1-x}$ is discontinuous at

a) $x = 0$ b) $x = 1$

c) x=2

(x) solve the $\lim_{x\to 1} \frac{\sqrt{x}-1}{x-1}$

a) $\frac{1}{2}$ b) 2

c) 3 d) None of these

(xi) Determine the value of $\frac{d}{dx}(\sin x^2) =$

a) $2x\cos x$ b) $2x\cos(x^2)$

c) 3 d) none

(xii) Evaluate $\frac{d}{dx}(x\sin x) =$

a) $\sin x + \cos x$ b) $\sin x + x\cos x$

c) $x\sin x + \cos x$ d) None of these.

(xiii) Evaluate $\frac{d}{dx}(x^2\cos x) =$

a) $x(2\cos x - x\sin x)$ b) $x^2(2\cos x - x\sin x)$

c) $x^2(2\cos x - x^2\sin x)$ d) None of these.

(xiv) Identify the correct option, equation of a straight line which is parallel to the straight line $3x - 2y - 5 = 0$ is

a) $3x + 2y - 5 = 0$ b) $3x - 3y - 5 = 0$

c) $3x - 2y + k = 0$ d) $2x - 2y - 5 = 0$

(xv) $\int \sin 3x dx = k\cos 3x$ then k is equal to, select the correct option

a) 3 b) $\frac{1}{3}$

c) $-\frac{1}{3}$ d) none

(xvi) Evaluate the value of the integration $\int_{-1}^{1} x^3 dx$ is

a) 0 b) 1
c) 2/3 d) -2/3

(xvii) Evaluate $\int_{-1}^{2} x^9 dx$

a) 102.3 b) 102.4
c) 1024 d) 0

(xviii) Evaluate the value of $\int_{0}^{2} [x] dx$

a) 0 b) 2
c) 1 d) 3

(xix) Identify the correct answer, the centre of the circle $(x+3)^2 + \left(y-\frac{7}{3}\right)^2 = 6$is in

a) 1^{st} quadrant b) 2^{nd} quadrant
c) 3^{rd} quadrant d) 4^{th} quadrant

(xx) If $2x^2 + 2y^2 + 5x - 6y + 2 = 0$ be the equation of a circle then Identify the radius of the circle is

a) $\frac{3\sqrt{5}}{4}$ b) 6

c) 5 d) 9

Group-B

(Short Answer Type Questions) 2.5 x 10=25

2. Evaluate $\int 2^{3x} dx$. (2.5)

3. Determine the value of y so that the line through (3,y) and (2,7) is parallel to line through (-1,4) and (0,6). (2.5)

4. Determine the perpendicular distance of the line $x = -y$ from the (1,0) (2.5)

5. Describe the concept of Successive Differentiation briefly. (2.5)

OR

Describe the method of finding solution of system of linear of equations using matrix method. (2.5)

6. Estimate $\lim_{x\to 0} \frac{\tan 3x - 2x}{3x - \sin^2 x}$ (2.5)

OR

If $y = \log(\tan x)$, then estimate $\left(\frac{dy}{dx}\right)_{x=\frac{\pi}{4}} =$ (2.5)

7. *Express* $\frac{dy}{dx}$ of the implicit function $x^y = y^x$ is (2.5)

OR

Estimate $\lim_{x\to 0} \frac{e^{\sin x}-1}{x} =$ (2.5)

8. If $y = e^{x^2 \sin x}$ then Construct $\frac{dy}{dx} =$ (2.5)

OR

Determine x so that 2 is the slope of the line through (2,5) and (x,3). (2.5)

9. If $y = e^{x^2 \sin x}$ then evaluate $\frac{dy}{dx}$ (2.5)

OR

Evaluate $\int \frac{1}{\sqrt{1+\cos 2x}} dx$ (2.5)

10. Evaluate $\int \frac{\sin x}{\sin(x-a)} dx$ (2.5)

OR

Evaluate $\int \frac{2^x+3^x}{5^x} dx$ (2.5)

11. Formulate the general solution of $\left(1 + x^2\right)dx + \left(1 + y^2\right)dy = 0.$ (2.5)

OR

Evaluate $\int \frac{e^x+1}{e^x} dx$ (2.5)

Group-C

(Long Answer Type Questions) 5 x 1=5

12. If $\begin{bmatrix} x+3 & x+2y \\ z-1 & 4t-6 \end{bmatrix} = \begin{bmatrix} 0 & 7 \\ 3 & 2t \end{bmatrix}$ then invent the value of x, y, z, t (5)

OR

Justify that the slope intercept form of a straight line and two-point form of a straight line are equivalent. (5)

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