Model Paper Mathematics Class-12

Time: 20 mins, **Marks: 20**

SECTION 'A'

Q.1 Choose the correct option.

i. The function $y = 5 + x^4$ is a/an……………..
(A) Constant function (B) Even function (C) Odd function (D) Both even and odd function

ii. $\lim_{x \to a} \frac{x^3 - a^3}{x - a} =$………………
(A) 3a (B) $2a^2$ (C) 0 (D) $3a^2$

iii. If $f(x) = x^{100}$ then $f'(1) =$…………..
(A) 100 (B) 99 (C) 50 (D) 0

iv. $\frac{d}{dx}\left(\frac{1}{g(x)}\right) =$……………
(A) $\frac{g'(x)}{g(x)}$ (B) $\frac{-g'(x)}{(g(x))^2}$ (C) $\frac{-g'(x)}{g(x)}$ (D) $\frac{g'(x)}{(g(x))^2}$

v. If $y = e^{2x}$ then y'' is equal to:
(A) e^{2x} (B) $4e^{2x}$ (C) $2e^{2x}$ (D) xe^{2x}

vi. $\int dx =$……………..
(A) 1 (B) -1 (C) 0 (D) $x + c$

vii. $\int (e^x + 1)dx =$…………..
(A) $e^x + c$ (B) $e^x + x + c$ (C) $e^x + x^2 + c$ (D) $e^{2x} + 1 + c$

viii. $\int \frac{f'(x)}{f(x)} dx =$…………
(A) $\ln|x| + c$ (B) $\ln|f(x)| + c$ (C) $\ln|f'(x)| + c$ (D) x^2

ix. $\int x^{-1} dx =$………..
(A) $0 + c$ (B) $-x^2 + c$ (C) $\frac{x^{-2}}{0} + c$ (D) $\ln|x| + c$

x. Solution of the differential equation $\frac{dy}{dx} = sec^2x$ is:
(A) $y = cosx + c$ (B) $y = secx + c$ (C) $y = cosec^2x + c$ (D) $y = tanx + c$

xi. The order of the differential equation $x\frac{d^2y}{d^2x} + (\frac{dy}{dx})^3 - 2 = 0$ is:
(A) 3 (B) 2 (C) 1 (D) 0

xii. Location of point $p(x, y)$ for which $x = y$ is in the quadrant:
(A) 1st & 3rd (B) 1st & 4th (C) 2nd & 4th (D) 1st & 2nd

xiii. Equation of a line passing through $(-2,3)$ having a slope of 0 is :
(A) y=2 (B) y=-3 (C) y=3 (D) $y = -2$

xiv. A circle is called a point circle if :
(A) r=1 (B) r=-1 (C) r=0 (D) r=2

xv. The radius of the circle $(x-3)^2+(y-2)^2=8$ is:
(A) 8 (B) 64 (C)$2\sqrt{2}$ (D) 2

xvi. Vertices of the ellipse $x^2+4y^2=16$ is :
(A) $(\pm4,0)$ (B)$(0,\pm4)$ (C)$(\pm2,0)$ (D)$(0,\pm2)$

xvii. Newton-Raphson method is_-----_iterative method.
(A) one point (B) Two points (C) Four points (D) There points

xviii. Bisection Method is used to find…………..
(A) Real roots only (B) Imaginary roots (C) Differentiate function (D) Integrate function

xix. If $f(x,y)=x^2y$ then $\frac{\partial f}{\partial x}=$…………………
(A)$2x$ (B) $2xy$ (C)x^2 (D) x^2y

xx. If $\vec{r}=cost\hat{\imath}+sint\hat{\jmath}+\hat{k}$ then the velocity vector $\vec{v}$ is:
(A)$sint\hat{\imath}+cost\hat{\jmath}+\hat{k}$ (B) $-cost\hat{\imath}+cost\hat{\jmath}$ (C) $-sint\hat{\imath}+cost\hat{\jmath}$ (D) $sint\hat{\imath}+cost\hat{\jmath}$

Model Paper Mathematics Class12 **Time 02hr 40min**

SECTION 'B' **Marks 50**

Q.2 Attempt Any TEN of the following short questions. Each question carries 5 marks.

i. Evaluate: $\lim_{x\to 7}\frac{\sqrt{x}-\sqrt{7}}{x-7}$. (1+1+2+1=5)

ii. Differentiate: $y=(3x^2-2).sinx$ (1+2+2=5)

iii. Use Maclaurin's series for $f(x)=sinx$
(2+2+1=5)

iv. Evaluate : $f(x)=\lim_{t\to 0}[tan2t\hat{\imath}+\ln(3+t)\,\hat{\jmath}+\hat{k}]$. (2+2+1=5)

v. Evaluate: $\int_1^2\frac{x}{x^2+2}dx$
(1+2+2=5)

vi. Evaluate: $\int e^{2x}cos3xdx$. (2+2+1=5)

vii. Write down an equation of the line which cuts the x-axis at $(2,0)$ and y-axis at $(0,-4)$. (2+2+1=5)

viii. Find the area of the triangular region ABC whose vertices are $A(1,4), B(2,-3)$ and $C(3,10)$.
(2+2+1=5)

ix. Find the center and radius of the circle $x^2+y^2+12x-10y=0$ (1+2+2=5)

x. Find an equation of the parabola whose focus is $F(-3,4)$ and directrix is $3x-4y+5=0$. (1+2+2=5)

xi. Find an equation of the ellipse and its directories whose foci are $(\pm 2,0)$ and eccentricity is $\frac{1}{2}$. (1+1+1+1+1=5)

xii. Find general solution of $\frac{dy}{dx}+cos2x+1=0$ (2+2+1=5)

xiii. Solve up to four iteration of Newton-Raphson iterative method for $f(x)=sinx, x_o=-2$ (1+1+1+1+1=5)

SECTION 'C' **Marks 30**

Note: Attempt Any Three questions. Each question carries 10 marks.

Q.3

i. If $f(x)=\sqrt{x+4}$, then find $f(x^2+4)$. (1+2+2=5)

ii. Use definition to find the derivative of $f(x)=x^2+2$. (1+2+2=5)

Q.4

i. Find the area bounded by curve $y=4-x^2$ and the x-axis. (1+2+2=5)

ii. Find an equation of the straight line if it is perpendicular to a line with slope -6 and its y-intercept is $\frac{4}{3}$. (2+2+1=5)

Q.5

i. Find the equation of tangent and normal at the point $(-\sqrt{13},\frac{9}{2})$ to the hyperbola $\frac{x^2}{4}-\frac{y^2}{9}=1$.(2+2+1=5)

ii. Find the equation of the circle whose center is $(0,0)$ and which contains the point$(1,2)$. (1+2+2=5)

Q.6

i. Find the partial derivatives f_x and f_y of $f(x,y)=x^2y^3tan^{-1}y$. (2+2+1=5)

ii. Use the trapezoidal rule to approximate the value of $I=\int_1^3 x^2dx$, $n=6$. (1+2+2=5