



Name

1۔ ہر سوال کے سامنے چار دائرے دئے گئے ہیں، صرف صحیح جواب والا دائرہ بھریں۔

2۔ دائروں کو شیڈ (بھرنے) کے لئے نیلے پکالے رنگ کا مارکر استعمال کریں۔

Roll No

3۔ جواب میں ایک سے زائد دائرے بھرنے سے جواب غلط تصور ہوگا۔

Time Allowed: 20 Minutes

SECTION – A

Marks : 20

- 1 The graph of a function $f(x)$ is concave upward on (a,b) , if..... $f''(x) > 0$ $f''(x) < 0$ $f''(x) = 0$ $f'(x) = 0$
- 2 $\int \frac{dx}{x^2 - a^2} = \dots\dots\dots$ $\ln \left| \frac{x-a}{x+a} \right| + c$ $\ln \left| \frac{x+a}{x-a} \right| + c$ $\frac{1}{2a} \ln \left| \frac{x+a}{x-a} \right|$ $\frac{1}{2a} \ln \left| \frac{x-a}{x+a} \right| + c$
- 3 $\int \tan x dx = \dots\dots\dots$ $\sec^2 x + c$ $\cot x + c$ $-\ln \cos x + c$ None of these
- 4 $\int_0^2 x^2 dx = \dots\dots\dots$ $\frac{2}{3}$ $\frac{4}{3}$ $\frac{7}{3}$ $\frac{8}{3}$
- 5 The slope on the points $(2, -1)$ and $(-5, 6)$ is equal to..... -1 $-\frac{5}{7}$ 1 $\frac{5}{7}$
- The order of differential equation
- 6 $\left(\frac{d^3y}{dx^3}\right)^2 + \left(\frac{d^2y}{dx^2}\right)^4 + \frac{dy}{dx} + 7y = 10$ is..... 4 3 2 1
- 7 The function $f(x,y) = x^3 - 2x^2y + xy^2$ is a homogenous function of degree..... 1 2 3 4
- 8 If $(x,y) = x^3y + xy^2$, then $\frac{\partial f}{\partial x} = \dots\dots\dots$ $3x^2y + xy^2$ $3x^2 + xy^2$ $3x^2y + 2xy$ $3x^2y + y^2$
- 9 Foci of the hyperbola $\frac{x^2}{9} - \frac{y^2}{16} = 1$ is..... $(\pm 3, 0)$ $(\pm 5, 0)$ $(\pm 4, 0)$ $(0, \pm 5)$
- 10 The equation of a line that passes through the point $A(1,2)$ and slope 5 will be..... $5x+y+3=0$ $5x+y-3=0$ $5x-y+3=0$ $5x-y-3=0$
- 11 Domain of the function $f(x) = \frac{x-1}{x+1}$ is.... R $R - \{1\}$ $R - \{-1\}$ $R - \{1, -1\}$
- 12 $\lim_{x \rightarrow 0} \frac{\sin x}{x} =$ 0 -1 1 e
- 13 $\frac{d}{dx}(2^x) = \dots\dots\dots$ $2^x \ln x$ $2^x \ln 2$ $\frac{2^x}{\ln x}$ $\frac{2^x}{\ln 2}$
- 14 $\frac{d}{dx}(\tan x)$ $-\sec^2 x$ $-\sec x \tan x$ $\sec^2 x$ $\sec x \tan x$
- 15 If $f(x) = e^{2x}$, then $f'''(x) =$ $4e^{2x}$ $6e^{2x}$ $8e^{2x}$ $10e^{2x}$
- 16 Distance between $(2,3)$ and $(3,2)$ is..... $\sqrt{2}$ $2\sqrt{2}$ $\sqrt{3}$ $2\sqrt{3}$
- 17 In $x^2 + y^2 - 2x + 4y + 3 = 0$, the centre $(-g, -f)$ is equal to..... $(-1, -2)$ $(1, 2)$ $(-1, 2)$ $(1, -2)$
- 18 The conic having eccentricity $e < 1$ is called..... Circle Parabola Ellipse Hyperbola
- 19 Focus of the parabola $x^2 + y = 0$ is..... $(4, 0)$ $(0, 4)$ $\left(-\frac{1}{4}, 0\right)$ $\left(0, -\frac{1}{4}\right)$
- 20 In $\frac{x^2}{25} - \frac{y^2}{16} = 1$, the asymptotes are..... $x = \pm \frac{4}{5}y$ $y = \pm \frac{4}{5}x$ $x = \pm \frac{5}{4}y$ $y = \pm \frac{5}{4}x$

PR XII (01) 19
MATHEMATICS (New)
 Inter Part-II
 (Fresh/Reappear)

Note: Time allowed for Section – B and Section – C is 2 Hours and 40 minutes.

Section – B

Marks: 50

Q-II Answer any TEN parts. Each part carries FIVE marks.

1. If $f(x) = 4x + 1$ and $g(x) = 2x^2 + 5x$. Find $g[f(x)]$ and $f[g(x)]$
2. Evaluate $\lim_{x \rightarrow 0} \frac{\left(\frac{1}{x+3}\right) - \frac{1}{3}}{x}$
3. Differentiate $y = (ax + b)^2$ by first principle rule.
4. Find $\frac{dy}{dx}$, if $y = 4 \cot \sqrt{x^2 - 1}$
5. Find $\frac{dy}{dx}$, if $y = \sqrt[3]{\ln(1-x^2)}$
6. Evaluate $\int (\tan 3x + \sec 3x) dx$ by substitution
7. Use integration by parts to evaluate $\int x^2(x-3)^{11} dx$
8. Evaluate $\int_1^2 \frac{4}{x^2 + 4x} dx$
9. Find centroid of the triangle ABC, whose vertices are A(4, -2), B(-2, 4) and C(5, 5)
10. Find an equation of a circle which passes through the three points (-3, 4), (-2, 0) and (1, 5)
11. Find the tangent equation to the parabola $y^2 = 4x$ at a point (1, 2).
12. Find the eccentricity of the ellipse if the length of the semi-major axis is $a = 4$ and semi-minor axis is $b = 2$.
13. For what value of C, the line $y = x + c$ will touch the hyperbola $\frac{x^2}{16} - \frac{y^2}{4} = 1$

Section – C

Marks: 30

Note : Attempt any THREE questions. Each question carries equal marks.

- Q-III** (a) Find x, so that $\frac{3}{2} \log_b 4 - \frac{2}{3} \log_b 8 + \log_b 2 = \log_b x$
- (b) If $y = \sin(\sin x)$, find y''' .
- Q-IV** (a) Find F' and F'' , when $F(\theta) = \sin^2 \theta i + \cos 2\theta j + \theta^2 k$
- (b) Find equation of a line that passes through the pair of points (3, 1), (-1, 3)
- Q-V** (a) Find the angle between the lines represented by the second degree homogenous equation $4x^2 - 9xy + 5y^2 = 0$.
- (b) Find the equation of the tangents drawn from the point (4, 3) to the circle $x^2 + y^2 = 9$
- Q-VI** (a) Solve initial value problem $y \frac{dy}{dx} + xy^2 - x = 0$, $y(0) = -1$
- (b) If $F(x, y, z) = x^2 y e^{2x} + (x + y - z)^2$. Find $\frac{\partial}{\partial z} f(1, 1, z^2)$ and $\frac{\partial}{\partial x} f(x, x, x)$