



Name

Roll No

Mathematics Paper - XII (A) (25)

171

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

2- دائروں کو شیڈ (بھرنے) کے لئے خطیے یا کالرنگ کا کارڈ استعمال کریں۔

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

Marks : 20

Time Allowed: 20 Minutes

SECTION - A

- 1 The solution of equation $\frac{dy}{dx} = 1$, is : ☒ $y = x + c$ ☐ $y = -x + c$ ☐ $yx = c$ ☐ $\frac{y}{x} = c$
- 2 If $f(x, y) = x^2 + y^2$, then f_x is : ☐ $2x + y^2$ ☐ $2y$ ☒ $2x$ ☐ $2x + 2y$
- 3 The slope of a line which is perpendicular to $y - 3x + 5 = 0$ is : ☐ 3 ☐ -3 ☐ $\frac{3}{5}$ ☒ $-\frac{1}{3}$
- 4 $\int a^x dx = \dots\dots\dots + c$ ☐ a^x ☒ $\frac{a^x}{\ln a}$ ☐ $a^x \ln a$ ☐ $a^x + \ln a$
- 5 $1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots\dots\dots =$ ☐ $\sin x$ ☐ $\cos x$ ☐ $\tan x$ ☒ e^x
- 6 y-intercept of a line $2x + 4y + 8 = 0$ is : ☐ 2 ☒ -2 ☐ 4 ☐ -4
- 7 In equation $x^2 + y^2 = 4$, the radius is : ☐ $\sqrt{2}$ ☐ -2 ☒ 2 ☐ 4
- 8 In parabola $x^2 = -8y$ the focus is : ☐ F(0,2) ☒ F(0,-2) ☐ F(-2,0) ☐ F(2,0)
- 9 The angle between the line $5x - 2y + 2 = 0$ & $2x + 5y - 7 = 0$ is : ☐ 271 ☐ 45 ☐ 60 ☒ 90
- 10 In equation $x^2 + y^2 + 2gx + 2fy + c = 0$, the coordinates of center are : ☐ $(-x, y)$ ☐ (x, y) ☒ $(-g, -f)$ ☐ (f, g)
- 11 If $f(x) = 2x - 5$ then $f^{-1}(x) = \dots\dots\dots$ ☐ $\frac{-x-5}{2}$ ☒ $\frac{x+5}{2}$ ☐ $\frac{x-5}{2}$ ☐ $\frac{2x}{5}$
- 12 Limit of the sequence $\left\{ \frac{n+3}{8n} \right\}$ is : ☒ $\frac{1}{8}$ ☐ 8 ☐ $\frac{3}{8}$ ☐ ∞
- 13 The slope of the tangent line is called : rate of change. ☐ Average ☒ Exact ☐ Approximate ☐ Both A and B
- 14 $\sinh x = \dots\dots\dots$ ☒ $\frac{e^x - e^{-x}}{2}$ ☐ $\frac{e^x + e^{-x}}{2}$ ☐ $\frac{e^x + e^{-x}}{2i}$ ☐ $e^x + e^{-x}$
- 15 In $f(x) = \frac{x^2 - 9}{x + 3}$ the point of discontinuity is $x = \dots\dots\dots$ ☐ 0 ☐ 1 ☐ 3 ☒ -3
- 16 The slope of tangent line to the graph of $f(x) = 3x - 7$ at point (3,2) is : ☐ 0 ☐ 1 ☐ 2 ☒ 3
- 17 If $(x) = f(x) = e^{mx}$ then $f'(x) = \dots\dots\dots$ ☒ me^{mx} ☐ e^{mx-1} ☐ $m^2 e^{mx}$ ☐ $(m-1)e^{mx}$
- 18 $\int \sec^2 x dx = \dots\dots\dots + c$ ☐ $\frac{1}{\cos^2 x}$ ☐ $\sin x$ ☒ $\tan x$ ☐ $2 \sec x$
- 19 The slope of a line in $2x + 5y - 7 = 0$ is : ☐ 2 ☐ 5 ☐ $\frac{2}{5}$ ☒ $-\frac{2}{5}$
- 20 $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, represents the equation : ☐ Parabola ☐ Hyperbola ☐ Circle ☒ Ellipse

P-321
PR XII (A-I-A) 25
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.

- Show that $\lim_{x \rightarrow 0} \frac{\sqrt{x+b} - \sqrt{b}}{x} = \frac{1}{2\sqrt{b}}$
- Find $f'(t)$ if $f(t) = \frac{3t+2}{(2t+3)(4t-1)}$
- Use Machaurins series to show that $e = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \dots$
- Evaluate $\int \frac{3x^2 + x}{\sqrt{x}} dx$
- Reduce the equation $7x - 10y = -13$ into symmetric form.
- Find equation of circle which passes through origin and intercepts arc 3 and 4 on the coordinates axis.
- Solve $\frac{dy}{dx} = \frac{x+y}{x-y}$
- Use trapezoidal rule to approximate $\int_1^3 x^2 dx$, $n = 4$
- Graph the parabola $x^2 = 8y$ and indicate the vertex, focus and focal chord.
- Find the points of intersection on the line $2x - y = 2$ and the ellipse $\frac{x^2}{9} + \frac{y^2}{4} = 1$
- Find the 2nd derivatives of $\vec{F}(\theta) = \sin^2 \theta \hat{i} - \cos^2 \theta \hat{j} + e^\theta \hat{k}$
- Find the interval in which the $f(x) = x^2 + 2x - 3$ is increasing or decreasing.
- Evaluate $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} x \sin x^2 dx$

Section – C

Marks: 30

Note: Attempt any THREE questions. Each question carries equal marks. 9.13

- Q-III (a) Evaluate $\int \sin^5 x \cos x dx$
- (b) Find $f'''(x)$ if $f(x) = \sin(\cos x)$
- Q-IV (a) Find $\frac{dy}{dx}$ when $y = \ell n \sqrt{\frac{x^2+1}{x^2-1}}$
- (b) Check the continuity of $f(x) = \frac{x-5}{(x+2)(x-3)}$
- Q-V (a) For what value of c , the line $x + y - c = 0$ touches the circle $x^2 + y^2 = 16$
- (b) In equation $\frac{x^2}{4} - \frac{y^2}{9} = 1$ find the tangent and normal equation at points $\left(-\sqrt{13}, \frac{9}{2}\right)$
- Q-VI (a) Find the angle of the triangle ABC whose vertices are A(1,2), B(4,2) and C(-2,3)
- (b) Find 3^x using Newton Raphson's method to approximate $f(x) = x^3 - 3$, $x_0 = 1$