MTN-12-G1-19

aper Code
lumber: 4195

2019 (A)
INTERMEDIATE PART-II (12th CLASS)

Roll No: _____

MATHEMATICS PAPER-II
GROUP-I

OBJECTIVE

TIME ALLOWED: 30 Minutes
MAXIMUM MARKS: 20

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve questions on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) $\int_1^2 2x\,dx =$ (A) 3 (B) 2 (C) 1 (D) 0

(2) $\int_1^2 \frac{1}{x}dx =$ (A) $2\ell nx$ (B) $\ell n2$ (C) $\ell n(1)$ (D) $\ell n3$

(3) $\int 5^{2x}\,dx =$ (A) 5^{2x} (B) $2(5^{2x})$ (C) $5^{2x}\ell n5$ (D) $2(5^{2x}\ell n5)$

(4) Distance of line $x + 2y + 5 = 0$ from origin is:- (A) 1 (B) $\sqrt{5}$ (C) 5 (D) 2

(5) Length of perpendicular from (1, 1) to the line $4x - 3y + 9 = 0$ equals:-
(A) 2 (B) 4 (C) 3 (D) 9

(6) Equation of horizontal line through (2, 3) is:- (A) $y = 3$ (B) $y = 2$ (C) $x = 3$ (D) $x = 2$

(7) Slope of vertical line is:- (A) 0 (B) 1 (C) ∞ (D) 2

(8) If $3x + 2y \leq 6$, point does not satisfy:- (A) (1 , 0) (B) (0 , 1) (C) (0 , 0) (D) (3 , 2)

(9) Radius of circle $x^2 + y^2 - 4x - 6y = 0$ is:- (A) $\sqrt{13}$ (B) $\sqrt{11}$ (C) $\sqrt{5}$ (D) 13

(10) Directrix of parabola $x^2 = 20y$ is:- (A) $x = 10$ (B) $x = 5$ (C) $y = -5$ (D) $x = -5$

(11) Parabola $x^2 = -8y$ opens:-
(A) Rightwards (B) Leftwards (C) Upwards (D) Downwards

(12) Magnitude of vector $6\underline{i} + 3\underline{j} - 2\underline{k}$ is:- (A) 7 (B) 6 (C) 3 (D) -2

(13) Direction cosines of y – axis are:-
(A) 0, 0, 1 (B) 1, 0, 0 (C) 0, 1, 0 (D) $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}$

(14) If $f(x) = x^3 + x$, then $f(x)$ is:-
(A) Constant function (B) Even function (C) Odd function (D) Implicit function

(15) $\lim_{x \to 4} \frac{x^2 - 6x + 8}{x - 4} =$ (A) 4 (B) 2 (C) 6 (D) 8

(16) $x = 3\cos t$, $y = 3\sin t$ represents:- (A) Line (B) Circle (C) Ellipse (D) Hyperbola

(17) If $f(x) = \sin x$, then $f''\left(\pi/2\right) =$ (A) 0 (B) 1 (C) 2 (D) -1

(18) $\frac{d}{dx}(\coth x) =$ (A) $-\operatorname{cosech}^2 x$ (B) $\operatorname{cosech}^2 x$ (C) $\tanh^2 x$ (D) $\coth x \operatorname{sech} x$

(19) $\frac{d}{dx}(e^{x^2}) =$ (A) e^{x^2} (B) $2e^{x^2}$ (C) $2xe^{x^2}$ (D) $2e^x$

(20) $\int \frac{\sin 2x}{4\sin x}dx =$ (A) $\sin 2x + c$ (B) $2\sin 2x + c$ (C) $\frac{1}{2}\sin x + c$ (D) $2\sin x + c$

ParhloPakistan.com

2019 (A) Roll No: MTH-II-G1-19

INTERMEDIATE PART-II (12th CLASS)

MATHEMATICS PAPER-II TIME ALLOWED: 2.30 Hours

GROUP-I SUBJECTIVE MAXIMUM MARKS: 80

NOTE: - Write same question number and its part number on answer book, as given in the question paper.

SECTION-I

2. Attempt any eight parts. $8 \times 2 = 16$

(i) Find the domain and range of $f(x) = \sqrt{x^2 - 4}$

(ii) If $f(x) = 2x + 1$, $g(x) = x^2 - 1$, find g of (x)

(iii) Evaluate $\lim\limits_{x \to 0} \dfrac{1 - \cos x}{\sin^2 x}$

(iv) Differentiate $\dfrac{x^2 + 1}{x^2 - 3}$ w.r.t x

(v) If $y = x^4 + 2x^2 + 2$, then show that $\dfrac{dy}{dx} = 4x\sqrt{y - 1}$

(vi) Find $\dfrac{dy}{dx}$ if $y^2 - xy - x^2 + 4 = 0$

(vii) Differentiate $x^2 - \dfrac{1}{x^2}$ w.r.t x^4

(viii) If $y = \sin^2 x$, $u = \sin x$, then find $\dfrac{dy}{du}$

(ix) Find $\dfrac{dy}{dx}$ if $y = x \cos y$

(x) Find $f'(x) = ?$, if $f(x) = \ell n(e^x + e^{-x})$

(xi) Define Critical Value.

(xii) State the Maclaurin's Series.

3. Attempt any eight parts. $8 \times 2 = 16$

(i) Find δy if $y = x^2 + 2x$ when x changes from 2 to 1.8.

(ii) Evaluate $\int \dfrac{dx}{\sqrt{x + 1} - \sqrt{x}}$, $x > 0$

(iii) Evaluate $\int \sqrt{1 - \cos 2x}\, dx$, $1 - \cos 2x > 0$

(iv) Evaluate $\int \dfrac{x}{\sqrt{4 + x^2}}\, dx$

(v) Evaluate $\int \dfrac{ax}{\sqrt{a^2 - x^4}}\, dx$

(vi) Evaluate $\int (\ell nx)^2\, dx$

(vii) Evaluate $\int_1^2 \dfrac{x}{x^2 + 2}\, dx$

(viii) Evaluate $\int_0^3 \dfrac{dx}{x^2 + 9}$

(ix) Solve $\sec x + \tan y \dfrac{dy}{dx} = 0$

(x) Find the area between the x-axis and the curve $y = \cos\dfrac{x}{2}$ from $x = -\pi$ to π.

(xi) Draw the graph and shade solution region for $5x - 4y \leq 20$

(xii) Define Optimal Solution.

P.T.O.

ParhloPakistan.com

4. **Attempt any nine parts.** $9 \times 2 = 18$

(i) Find the mid point of the line segment joining the points $\left(-\sqrt{5}, -\frac{1}{3}\right)$ and $\left(-3\sqrt{5}, 5\right)$

(ii) Find 'K' so that line joining the points $A(7, 3)$ and $B(K, -6)$ has a slope $\frac{1}{2}$.

(iii) Find the equation of line passing through the point $(-9, 0)$ and has a slop -4.

(iv) Define 'Homogeneous equation' of degree n where 'n' is a positive integer.

(v) Find the equation of circle with centre $(-3, 5)$ and radius 7.

(vi) Find the coordinates of vertex and focus of the parabola $x^2 = 4(y - 1)$

(vii) Find the equation of Ellipse having foci $(\pm 3, 0)$ and minor axis of length 10.

(viii) Find the coordinates of foci and vertices of Hyperbola $\frac{x^2}{4} - \frac{y^2}{9} = 1$

(ix) Define "Position Vector" of a point..

(x) If $\left|\alpha \underline{i} + (\alpha + 1)\underline{j} + 2\underline{k}\right| = 3$, then find value of '$\alpha$'.

(xi) Find 'α' so that the vectors $2\underline{i} + \alpha \underline{j} + 5\underline{k}$ and $3\underline{i} + \underline{j} + \alpha \underline{k}$ are perpendicular.

(xii) Find $\underline{a} \times \underline{b}$ if $\underline{a} = 2\underline{i} + \underline{j} - \underline{k}$ and $\underline{b} = \underline{i} - \underline{j} + \underline{k}$

(xiii) Prove that the vectors $\underline{i} - 2\underline{j} + 3\underline{k}$, $-2\underline{i} + 3\underline{j} - 4\underline{k}$ and $\underline{i} - 3\underline{j} + 5\underline{k}$ are coplanar.

SECTION-II

NOTE: - Attempt any three questions. $3 \times 10 = 30$

5.(a) Prove that $\lim_{\theta \to 0} \frac{\sin\theta}{\theta} = 1$, θ is measured in radians.

(b) Find the extreme values for the function $f(x) = (x - 2)^2 (x - 1)$

6.(a) Show that $\int \sqrt{a^2 - x^2}\, dx = \frac{a^2}{2} Sin^{-1}\frac{x}{a} + \frac{x}{2}\sqrt{a^2 - x^2} + c$

(b) The points $(4, -2)$, $(-2, 4)$ and $(5, 5)$ are the vertices of a triangle. Find in-centre of the triangle.

7. (a) Evaluate $\int_{\frac{1}{2}}^{\frac{\sqrt{3}}{2}} \frac{Sin^{-1}x}{\sqrt{1 - x^2}}\, dx$ $x \neq 1, -1$

(b) Graph the feasible region of the following system of linear inequalities and find the corner points

$2x - 3y \leq 6$

$2x + 3y \leq 12$

$x \geq 0$

$y \geq 0$

8. (a) Find an equation of the line through the intersection of the lines $x - y - 4 = 0$ and $7x + y + 20 = 0$ and parallel to the line $6x + y - 14 = 0$

(b) Show that the circles $x^2 + y^2 + 2x - 2y - 7 = 0$ and $x^2 + y^2 - 6x + 4y + 9 = 0$ touch externally.

9.(a) Find an equation of the parabola having focus at $(-3, 1)$ and directrix is $x = 3$.

(b) Prove that the line segment joining the mid points of the sides of a quadrilateral taken in order form a parallelogram.

ParhloPakistan.com