

INTERMEDIATE PART-II (12<sup>th</sup> 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 × 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  $\lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin^2 x}$
- (iv) Differentiate  $\frac{x^2 + 1}{x^2 - 3}$  w.r.t  $x$
- (v) If  $y = x^4 + 2x^2 + 2$ , then show that  $\frac{dy}{dx} = 4x\sqrt{y-1}$
- (vi) Find  $\frac{dy}{dx}$  if  $y^2 - xy - x^2 + 4 = 0$
- (vii) Differentiate  $x^2 - \frac{1}{x^2}$  w.r.t  $x^4$
- (viii) If  $y = \sin^2 x$ ,  $u = \sin x$ , then find  $\frac{dy}{du}$
- (ix) Find  $\frac{dy}{dx}$  if  $y = x \cos y$
- (x) Find  $f'(x) = ?$ , if  $f(x) = \ln(e^x + e^{-x})$
- (xi) Define Critical Value.

(xii) State the Maclaurin's Series.

3. Attempt any eight parts.

8 × 2 = 16

- (i) Find  $\delta y$  if  $y = x^2 + 2x$  when  $x$  changes from 2 to 1.8.
- (ii) Evaluate  $\int \frac{dx}{\sqrt{x+1} - \sqrt{x}}$ ,  $x > 0$
- (iii) Evaluate  $\int \sqrt{1 - \cos 2x} dx$ ,  $1 - \cos 2x > 0$
- (iv) Evaluate  $\int \frac{x}{\sqrt{4+x^2}} dx$
- (v) Evaluate  $\int \frac{ax}{\sqrt{a^2 - x^4}} dx$
- (vi) Evaluate  $\int (\ln x)^2 dx$
- (vii) Evaluate  $\int_1^2 \frac{x}{x^2 + 2} dx$
- (viii) Evaluate  $\int_0^3 \frac{dx}{x^2 + 9}$
- (ix) Solve  $\sec x + \tan y \frac{dy}{dx} = 0$
- (x) Find the area between the  $x$ -axis and the curve  $y = \cos \frac{x}{2}$  from  $x = -\pi$  to  $\pi$ .
- (xi) Draw the graph and shade solution region for  $5x - 4y \leq 20$
- (xii) Define Optimal Solution.

(2)

4. Attempt any nine parts.

9 × 2 = 18

- (i) Find the mid point of the line segment joining the points  $\left(-\sqrt{5}, -\frac{1}{3}\right)$  and  $(-3\sqrt{5}, 5)$
- (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 slope  $-4$ .
- (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  $|\alpha \underline{i} + (\alpha + 1)\underline{j} + 2\underline{k}| = 3$ , then find value of ' $\alpha$ '.
- (xi) Find ' $\alpha$ ' 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 × 10 = 30**

- 5.(a) Prove that  $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ ,  $\theta$  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
- $$\begin{aligned} 2x - 3y &\leq 6 \\ 2x + 3y &\leq 12 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$
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.

Paper Code

2019 (A)

Roll No: \_\_\_\_\_

Number: 4191

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

MATHEMATICS PAPER-II

TIME ALLOWED: 30 Minutes

GROUP-I

OBJECTIVE

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) If  $f(x) = x^3 + x$ , then  $f(x)$  is:-  
 (A) Constant function (B) Even function (C) Odd function (D) Implicit function
- (2)  $\lim_{x \rightarrow 4} \frac{x^2 - 6x + 8}{x - 4} =$  (A) 4 (B) 2 (C) 6 (D) 8
- (3)  $x = 3 \cos t$ ,  $y = 3 \sin t$  represents:- (A) Line (B) Circle (C) Ellipse (D) Hyperbola
- (4) If  $f(x) = \sin x$ , then  $f''\left(\frac{\pi}{2}\right) =$  (A) 0 (B) 1 (C) 2 (D) -1
- (5)  $\frac{d}{dx}(\coth x) =$  (A)  $-\operatorname{cosech}^2 x$  (B)  $\operatorname{cosech}^2 x$  (C)  $\tan h^2 x$  (D)  $\coth x \operatorname{sech} x$
- (6)  $\frac{d}{dx}(e^{x^2}) =$  (A)  $e^{x^2}$  (B)  $2e^{x^2}$  (C)  $2xe^{x^2}$  (D)  $2e^x$
- (7)  $\int \frac{\sin 2x}{4 \sin x} dx =$  (A)  $\sin 2x + c$  (B)  $2 \sin 2x + c$  (C)  $\frac{1}{2} \sin x + c$  (D)  $2 \sin x + c$
- (8)  $\int_1^2 2x dx =$  (A) 3 (B) 2 (C) 1 (D) 0
- (9)  $\int_1^2 \frac{1}{x} dx =$  (A)  $2 \ln x$  (B)  $\ln 2$  (C)  $\ln(1)$  (D)  $\ln 3$
- (10)  $\int 5^{2x} dx =$  (A)  $5^{2x}$  (B)  $2(5^{2x})$  (C)  $5^{2x} \ln 5$  (D)  $2(5^{2x} \ln 5)$
- (11) Distance of line  $x + 2y + 5 = 0$  from origin is:- (A) 1 (B)  $\sqrt{5}$  (C) 5 (D) 2
- (12) Length of perpendicular from (1, 1) to the line  $4x - 3y + 9 = 0$  equals:-  
 (A) 2 (B) 4 (C) 3 (D) 9
- (13) Equation of horizontal line through (2, 3) is:- (A)  $y = 3$  (B)  $y = 2$  (C)  $x = 3$  (D)  $x = 2$
- (14) Slope of vertical line is:- (A) 0 (B) 1 (C)  $\infty$  (D) 2
- (15) If  $3x + 2y \leq 6$ , point does not satisfy:- (A) (1, 0) (B) (0, 1) (C) (0, 0) (D) (3, 2)
- (16) Radius of circle  $x^2 + y^2 - 4x - 6y = 0$  is:- (A)  $\sqrt{13}$  (B)  $\sqrt{11}$  (C)  $\sqrt{5}$  (D) 13
- (17) Directrix of parabola  $x^2 = 20y$  is:- (A)  $x = 10$  (B)  $x = 5$  (C)  $y = -5$  (D)  $x = -5$
- (18) Parabola  $x^2 = -8y$  opens:-  
 (A) Rightwards (B) Leftwards (C) Upwards (D) Downwards
- (19) Magnitude of vector  $6\mathbf{i} + 3\mathbf{j} - 2\mathbf{k}$  is:- (A) 7 (B) 6 (C) 3 (D) -2
- (20) Direction cosines of  $y$ -axis are:-  
 (A) 0, 0, 1 (B) 1, 0, 0 (C) 0, 1, 0 (D)  $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}$

Paper Code

2019 (A)

Roll No: \_\_\_\_\_

Number: 4193

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

MATHEMATICS PAPER-II

TIME ALLOWED: 30 Minutes

GROUP-I

OBJECTIVE

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) Radius of circle  $x^2 + y^2 - 4x - 6y = 0$  is:- (A)  $\sqrt{13}$  (B)  $\sqrt{11}$  (C)  $\sqrt{5}$  (D) 13
- (2) Directrix of parabola  $x^2 = 20y$  is:- (A)  $x = 10$  (B)  $x = 5$  (C)  $y = -5$  (D)  $x = -5$
- (3) Parabola  $x^2 = -8y$  opens:-  
(A) Rightwards (B) Leftwards (C) Upwards (D) Downwards
- (4) Magnitude of vector  $6\mathbf{i} + 3\mathbf{j} - 2\mathbf{k}$  is:- (A) 7 (B) 6 (C) 3 (D) -2
- (5) Direction cosines of  $y$ -axis are:-  
(A) 0, 0, 1 (B) 1, 0, 0 (C) 0, 1, 0 (D)  $\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}$
- (6) If  $f(x) = x^3 + x$ , then  $f(x)$  is:-  
(A) Constant function (B) Even function (C) Odd function (D) Implicit function
- (7)  $\lim_{x \rightarrow 4} \frac{x^2 - 6x + 8}{x - 4} =$  (A) 4 (B) 2 (C) 6 (D) 8
- (8)  $x = 3 \cos t, y = 3 \sin t$  represents:- (A) Line (B) Circle (C) Ellipse (D) Hyperbola
- (9) If  $f(x) = \sin x$ , then  $f''\left(\frac{\pi}{2}\right) =$  (A) 0 (B) 1 (C) 2 (D) -1
- (10)  $\frac{d}{dx}(\coth x) =$  (A)  $-\operatorname{cosech}^2 x$  (B)  $\operatorname{cosech}^2 x$  (C)  $\tanh^2 x$  (D)  $\coth x \operatorname{sech} x$
- (11)  $\frac{d}{dx}(e^{x^2}) =$  (A)  $e^{x^2}$  (B)  $2e^{x^2}$  (C)  $2xe^{x^2}$  (D)  $2e^x$
- (12)  $\int \frac{\sin 2x}{4 \sin x} dx =$  (A)  $\sin 2x + c$  (B)  $2 \sin 2x + c$  (C)  $\frac{1}{2} \sin x + c$  (D)  $2 \sin x + c$
- (13)  $\int_1^2 2x dx =$  (A) 3 (B) 2 (C) 1 (D) 0
- (14)  $\int_1^2 \frac{1}{x} dx =$  (A)  $2 \ln x$  (B)  $\ln 2$  (C)  $\ln(1)$  (D)  $\ln 3$
- (15)  $\int 5^{2x} dx =$  (A)  $5^{2x}$  (B)  $2(5^{2x})$  (C)  $5^{2x} \ln 5$  (D)  $2(5^{2x} \ln 5)$
- (16) Distance of line  $x + 2y + 5 = 0$  from origin is:- (A) 1 (B)  $\sqrt{5}$  (C) 5 (D) 2
- (17) Length of perpendicular from (1, 1) to the line  $4x - 3y + 9 = 0$  equals:-  
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- (18) Equation of horizontal line through (2, 3) is:- (A)  $y = 3$  (B)  $y = 2$  (C)  $x = 3$  (D)  $x = 2$
- (19) Slope of vertical line is:- (A) 0 (B) 1 (C)  $\infty$  (D) 2
- (20) If  $3x + 2y \leq 6$ , point does not satisfy:- (A) (1, 0) (B) (0, 1) (C) (0, 0) (D) (3, 2)

Paper Code

2019 (A)

Roll No: \_\_\_\_\_

Number: 4195

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

MATHEMATICS PAPER-II

TIME ALLOWED: 30 Minutes

GROUP-I

OBJECTIVE

MAXIMUM MARKS: 20

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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)  $2\ln x$  (B)  $\ln 2$  (C)  $\ln(1)$  (D)  $\ln 3$
- (3)  $\int 5^{2x} dx =$  (A)  $5^{2x}$  (B)  $2(5^{2x})$  (C)  $5^{2x} \ln 5$  (D)  $2(5^{2x} \ln 5)$
- (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)  $\infty$  (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
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(A) Rightwards (B) Leftwards (C) Upwards (D) Downwards
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- (13) Direction cosines of  $y$ -axis are:-  
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- (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)  $2 \sin x + c$

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2019 (A)

Roll No: \_\_\_\_\_

Number: 4197

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

MATHEMATICS PAPER-II

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GROUP-I

OBJECTIVE

MAXIMUM MARKS: 20

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Q.No.1

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- (6)  $\int 5^{2x} dx =$  (A)  $5^{2x}$  (B)  $2(5^{2x})$  (C)  $5^{2x} \ln 5$  (D)  $2(5^{2x} \ln 5)$
- (7) Distance of line  $x + 2y + 5 = 0$  from origin is:- (A) 1 (B)  $\sqrt{5}$  (C) 5 (D) 2
- (8) Length of perpendicular from (1, 1) to the line  $4x - 3y + 9 = 0$  equals:-  
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- (9) Equation of horizontal line through (2, 3) is:- (A)  $y = 3$  (B)  $y = 2$  (C)  $x = 3$  (D)  $x = 2$
- (10) Slope of vertical line is:- (A) 0 (B) 1 (C)  $\infty$  (D) 2
- (11) If  $3x + 2y \leq 6$ , point does not satisfy:- (A) (1, 0) (B) (0, 1) (C) (0, 0) (D) (3, 2)
- (12) Radius of circle  $x^2 + y^2 - 4x - 6y = 0$  is:- (A)  $\sqrt{13}$  (B)  $\sqrt{11}$  (C)  $\sqrt{5}$  (D) 13
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- (17) If  $f(x) = x^3 + x$ , then  $f(x)$  is:-  
(A) Constant function (B) Even function (C) Odd function (D) Implicit function
- (18)  $\lim_{x \rightarrow 4} \frac{x^2 - 6x + 8}{x - 4} =$  (A) 4 (B) 2 (C) 6 (D) 8
- (19)  $x = 3 \cos t, y = 3 \sin t$  represents:- (A) Line (B) Circle (C) Ellipse (D) Hyperbola
- (20) If  $f(x) = \sin x$ , then  $f''\left(\frac{\pi}{2}\right) =$  (A) 0 (B) 1 (C) 2 (D) -1

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

## MATHEMATICS PAPER-II

TIME ALLOWED: 2.30 Hours

## GROUP-II

## 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 × 2 = 16

- (i) Find the domain and range of  $f(x) = |x - 3|$
- (ii) If  $f(x) = 3x^4 - 2x^2$ ,  $g(x) = \frac{2}{\sqrt{x}}$ ,  $x \neq 0$ , find  $gof(x)$
- (iii) Evaluate  $\lim_{\theta \rightarrow 0} \frac{1 - \cos \theta}{\sin \theta}$
- (iv) Differentiate  $\frac{2x - 3}{2x + 1}$  w.r.t  $x$ .
- (v) If  $y = (x - 5)(3 - x)$ , then find  $\frac{dy}{dx}$
- (vi) If  $x^2 + y^2 = 4$ , then show that  $\frac{dy}{dx} = \frac{-x}{\sqrt{4 - x^2}}$
- (vii) Differentiate  $(1 + x^2)^n$  w.r.t  $x^2$
- (viii) If  $y = \sin x$ ,  $u = \cot x$ , then find  $\frac{dy}{du}$
- (ix) Show that  $\frac{dy}{dx} = \frac{y}{x}$ , if  $\frac{y}{x} = \tan^{-1} \frac{y}{x}$
- (x) Find  $f'(x)$ , if  $f(x) = e^{\sqrt{x} - 1}$
- (xi) Define Critical Point.
- (xii) State the Taylor's Series.

3. Attempt any eight parts.

8 × 2 = 16

- (i) Find  $\delta y$  if  $y = \sqrt{x}$  when  $x$  changes from 4 to 4.41.
- (ii) Evaluate  $\int \frac{3 - \cos 2x}{1 + \cos 2x} dx$  ( $\cos 2x \neq -1$ )
- (iii) Evaluate  $\int \frac{(1 + e^x)^3}{e^x} dx$
- (iv) Evaluate  $\int \frac{\cot \sqrt{x}}{\sqrt{x}} dx$ ,  $x > 0$
- (v) Evaluate  $\int \frac{\sec^2 x}{\sqrt{\tan x}} dx$
- (vi) Evaluate  $\int x \sin x dx$
- (vii) Evaluate  $\int_{-2}^0 \frac{1}{(2x - 1)^2} dx$
- (viii) Evaluate  $\int_1^2 \ln x dx$
- (ix) Solve  $\sin y \cos ec x \frac{dy}{dx} = 1$
- (x) Find Area bounded by cos function from  $x = \frac{-\pi}{2}$  to  $x = \frac{\pi}{2}$
- (xi) Graph the Solution Region for  $3x - 2y \geq 6$
- (xii) Define "Objective Function".

(2)

## 4. Attempt any nine parts.

9 × 2 = 18

- (i) Find the co-ordinates of the point that divides the join of  $A(-6, 3)$  and  $B(5, -2)$  in the ratio 2:3 internally.
- (ii) Convert equation  $4x + 7y - 2 = 0$  into two intercepts form.
- (iii) Show that the point  $(-2, 4)$  lies above the line  $4x + 5y - 3 = 0$ .
- (iv) Define 'Medians' of triangle.
- (v) Find the slope of tangent to circle  $x^2 + y^2 = 25$  at point  $(4, 3)$ .
- (vi) Find the co-ordinates of vertex and focus of the parabola  $y = 6x^2 - 1$
- (vii) Find the equation of the Ellipse with foci  $(\pm 3\sqrt{3}, 0)$  and vertices  $(\pm 6, 0)$
- (viii) Find the equation of the Hyperbola with the centre  $(0, 0)$  Foci  $(\pm 6, 0)$  and Vertices  $(\pm 4, 0)$ .
- (ix) If  $\overline{AB} = \overline{CD}$ . Find the coordinates of the point  $A$  when points  $B, C, D$  are  $(1, 2), (-2, 5), (4, 11)$  respectively.
- (x) Find a vector of length 5 in the direction opposite that of  $\underline{v} = \underline{i} - 2\underline{j} + 3\underline{k}$ .
- (xi) Find value of ' $\alpha$ ' so that vectors  $\alpha\underline{i} + 2\alpha\underline{j} + \underline{k}$  and  $\underline{i} + \alpha\underline{j} + 3\underline{k}$  are perpendicular.
- (xii) Define direction angles of a vector.
- (xiii) Find  $\underline{u} \cdot (\underline{v} \times \underline{w})$  when  $\underline{u} = [3, 0, 2]$ ;  $\underline{v} = [1, 2, 1]$  and  $\underline{w} = [0, -1, 4]$

**SECTION-II****NOTE: - Attempt any three questions.**

3 × 10 = 30

- 5.(a) Evaluate  $\lim_{\theta \rightarrow 0} \frac{\tan \theta - \sin \theta}{\sin^3 \theta}$
- (b) If  $x = a \cos^3 \theta$ ,  $y = b \sin^3 \theta$  show that  $a \frac{dy}{dx} + b \tan \theta = 0$
- 6.(a) Evaluate  $\int \frac{7x - 1}{(x - 1)^2 (x + 1)} dx \quad x > 1$
- (b) Find equations of the altitudes of the triangle whose vertices are  $A(-3, 2), B(5, 4), C(3, -8)$
7. (a) Determine the area bounded by the parabola  $y = x^2 + 2x - 3$  and the  $x$ -axis.
- (b) Graph the feasible region of the following system of linear inequalities
- $$\begin{aligned} 3x + 7y &\leq 21 \\ x - y &\leq 3 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$
8. (a) Find the lines represented by  $3x^2 + 7xy + 2y^2 = 0$ . Also find measure of the angle between them.
- (b) Find an equation of the circle that passes through  $A(4, 5), B(-4, -3), C(8, -3)$
- 9.(a) Show that the equation  $9x^2 - 18x + 4y^2 + 8y - 23 = 0$  represents an ellipse. Find its elements.
- (b) Using vector method, in any triangle  $ABC$  prove that  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$



Paper Code

2019 (A)

Roll No: \_\_\_\_\_

Number: 4192

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

MATHEMATICS PAPER-II

TIME ALLOWED: 30 Minutes

GROUP-II

OBJECTIVE

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) If  $f(x) = x^2 + \cos x$ , then  $f(x)$  is:-  
 (A) Constant function (B) Even function (C) Odd function (D) Linear function
- (2) If  $f(x) = x^3 - 2x^2 + 4x - 1$ , then  $f(-2)$  :- (A) 14 (B) -14 (C) -25 (D) 25
- (3)  $\frac{d}{dx}(4x + 7)^9 =$   
 (A)  $36(4x + 7)^8$  (B)  $36(4x + 7)^9$  (C)  $28(4x + 7)^8$  (D)  $63(4x + 7)^8$
- (4) If  $f(x) = 2^{2x}$ , then  $f'(x) =$   
 (A)  $2^{2x-1}$  (B)  $2^{2x} \ln 2$  (C)  $2^{2x+1} \ln 2$  (D)  $\frac{2^{2x}}{\ln 2}$
- (5)  $\frac{d}{dx} \left( \cos^{-1} \frac{x}{a} \right) =$   
 (A)  $\frac{1}{1-x^2}$  (B)  $\frac{1}{1+x^2}$  (C)  $\frac{1}{\sqrt{a^2-x^2}}$  (D)  $\frac{-1}{\sqrt{a^2-x^2}}$
- (6) If  $f(x) = x^{10}$ , then  $f''(1) =$  (A) 90 (B) 9 (C) 10 (D) 100
- (7)  $\int \frac{1}{x^2} dx =$  (A)  $\ln x + c$  (B)  $\ln x^2 + c$  (C)  $\frac{-2}{x^3} + c$  (D)  $\frac{-1}{x} + c$
- (8)  $\int \tan \frac{\pi}{4} dx =$  (A)  $\ln \left( \sin \frac{\pi}{4} \right) + c$  (B)  $x + c$  (C)  $\sec^2 \frac{\pi}{4}$  (D) 1
- (9)  $\int \sec^2 2x dx =$  (A)  $\frac{1}{2} \tan 2x$  (B)  $\tan 2x$  (C)  $\frac{1}{2} \tan x$  (D)  $2 \tan 2x$
- (10)  $\int_0^{\frac{3\pi}{2}} \cos x dx =$  (A) 0 (B) 1 (C) -1 (D) 2
- (11) Distance of line  $5x + 12y + 39 = 0$  from  $(0, 0)$  is:- (A) 3 (B) 5 (C) 12 (D) 39
- (12) Equation of horizontal line through  $(a, b)$  is:-  
 (A)  $y = a$  (B)  $y = b$  (C)  $x = a$  (D)  $x = b$
- (13) The line  $ax + by + c = 0$  will represent equation of straight line parallel to  $y$ -axis if:-  
 (A)  $a = 0$  (B)  $b = 0$  (C)  $c = 0$  (D)  $a = b$
- (14) Point  $\left( +\frac{3}{7}, -\frac{5}{7} \right)$  lies in:- (A) I quadrant (B) II quadrant (C) III quadrant (D) IV quadrant
- (15) The point  $(1, 2)$  satisfies the inequality:-  
 (A)  $x + 2y > 3$  (B)  $x - 2y > 3$  (C)  $x - 2y > 5$  (D)  $x + 2y < 3$
- (16) Radius of circle  $x^2 + y^2 + 4x + 2y - 4 = 0$  is:- (A) 3 (B) 2 (C) 4 (D) 1
- (17) Latus rectum of parabola  $x^2 = 8y$  is:-  
 (A)  $y = -2$  (B)  $y = 2$  (C)  $x = 2$  (D)  $x = -2$
- (18) Major axis of ellipse  $\frac{x^2}{8} + \frac{y^2}{12} = 1$  is:- (A)  $2\sqrt{3}$  (B) 8 (C)  $4\sqrt{3}$  (D) 5
- (19) Direction cosines of  $x$ -axis are:- (A) 1, 1, 0 (B) 1, 0, 1 (C) 1, 0, 0 (D) 0, 0, 1
- (20)  $[k \ i \ j] =$  (A) 3 (B) 0 (C) -2 (D) 1

Paper Code

2019 (A)

Roll No: \_\_\_\_\_

Number: 4194

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)
**MATHEMATICS PAPER-II**  
**GROUP-II**

TIME ALLOWED: 30 Minutes

MAXIMUM MARKS: 20

**OBJECTIVE**

**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)  $\int_0^{\frac{3\pi}{2}} \cos x \, dx =$  (A) 0 (B) 1 (C) -1 (2) 2
- (2) Distance of line  $5x + 12y + 39 = 0$  from  $(0, 0)$  is:- (A) 3 (B) 5 (C) 12 (D) 39
- (3) Equation of horizontal line through  $(a, b)$  is:-  
(A)  $y = a$  (B)  $y = b$  (C)  $x = a$  (D)  $x = b$
- (4) The line  $ax + by + c = 0$  will represent equation of straight line parallel to  $y$ -axis if:-  
(A)  $a = 0$  (B)  $b = 0$  (C)  $c = 0$  (D)  $a = b$
- (5) Point  $(+\frac{3}{7}, -\frac{5}{7})$  lies in:- (A) I quadrant (B) II quadrant (C) III quadrant (D) IV quadrant
- (6) The point  $(1, 2)$  satisfies the inequality:-  
(A)  $x + 2y > 3$  (B)  $x - 2y > 3$  (C)  $x - 2y > 5$  (D)  $x + 2y < 3$
- (7) Radius of circle  $x^2 + y^2 + 4x + 2y - 4 = 0$  is:- (A) 3 (B) 2 (C) 4 (D) 1
- (8) Latus rectum of parabola  $x^2 = 8y$  is:-  
(A)  $y = -2$  (B)  $y = 2$  (C)  $x = 2$  (D)  $x = -2$
- (9) Major axis of ellipse  $\frac{x^2}{8} + \frac{y^2}{12} = 1$  is:- (A)  $2\sqrt{3}$  (B) 8 (C)  $4\sqrt{3}$  (D) 5
- (10) Direction cosines of  $x$ -axis are:- (A) 1, 1, 0 (B) 1, 0, 1 (C) 1, 0, 0 (D) 0, 0, 1
- (11)  $[\underline{k} \ \underline{i} \ \underline{j}] =$  (A) 3 (B) 0 (C) -2 (D) 1
- (12) If  $f(x) = x^2 + \cos x$ , then  $f(x)$  is:-  
(A) Constant function (B) Even function (C) Odd function (D) Linear function
- (13) If  $f(x) = x^3 - 2x^2 + 4x - 1$ , then  $f(-2)$ :- (A) 14 (B) -14 (C) -25 (D) 25
- (14)  $\frac{d}{dx}(4x + 7)^9 =$   
(A)  $36(4x + 7)^8$  (B)  $36(4x + 7)^9$  (C)  $28(4x + 7)^8$  (D)  $63(4x + 7)^8$
- (15) If  $f(x) = 2^{2x}$ , then  $f'(x) =$   
(A)  $2^{2x-1}$  (B)  $2^{2x} \ln 2$  (C)  $2^{2x+1} \ln 2$  (D)  $\frac{2^{2x}}{\ln 2}$
- (16)  $\frac{d}{dx} \left( \cos^{-1} \frac{x}{a} \right) =$   
(A)  $\frac{1}{1-x^2}$  (B)  $\frac{1}{1+x^2}$  (C)  $\frac{1}{\sqrt{a^2-x^2}}$  (D)  $\frac{-1}{\sqrt{a^2-x^2}}$
- (17) If  $f(x) = x^{10}$ , then  $f''(1) =$  (A) 90 (B) 9 (C) 10 (D) 100
- (18)  $\int \frac{1}{x^2} dx =$  (A)  $\ln x + c$  (B)  $\ln x^2 + c$  (C)  $\frac{-2}{x^3} + c$  (D)  $\frac{-1}{x} + c$
- (19)  $\int \tan \frac{\pi}{4} dx =$  (A)  $\ln \left( \sin \frac{\pi}{4} \right) + c$  (B)  $x + c$  (C)  $\sec^2 \frac{\pi}{4}$  (D) 1
- (20)  $\int \sec^2 2x dx =$  (A)  $\frac{1}{2} \tan 2x$  (B)  $\tan 2x$  (C)  $\frac{1}{2} \tan x$  (D)  $2 \tan 2x$

Paper Code

2019 (A)

Roll No: \_\_\_\_\_

Number: 4196

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

MATHEMATICS PAPER-II

TIME ALLOWED: 30 Minutes

GROUP-II

**OBJECTIVE**

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)  $\int \frac{1}{x^2} dx =$  (A)  $\ln x + c$  (B)  $\ln x^2 + c$  (C)  $\frac{-2}{x^3} + c$  (D)  $\frac{-1}{x} + c$
- (2)  $\int \tan \frac{\pi}{4} dx =$  (A)  $\ln \left( \sin \frac{\pi}{4} \right) + c$  (B)  $x + c$  (C)  $\sec^2 \frac{\pi}{4}$  (D) 1
- (3)  $\int \sec^2 2x dx =$  (A)  $\frac{1}{2} \tan 2x$  (B)  $\tan 2x$  (C)  $\frac{1}{2} \tan x$  (D)  $2 \tan 2x$
- (4)  $\int_0^{\frac{3\pi}{2}} \cos x dx =$  (A) 0 (B) 1 (C) -1 (D) 2
- (5) Distance of line  $5x + 12y + 39 = 0$  from  $(0, 0)$  is:- (A) 3 (B) 5 (C) 12 (D) 39
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- (7) The line  $ax + by + c = 0$  will represent equation of straight line parallel to  $y$ -axis if:-  
(A)  $a = 0$  (B)  $b = 0$  (C)  $c \neq 0$  (D)  $a = b$
- (8) Point  $\left( +\frac{3}{7}, -\frac{5}{7} \right)$  lies in:- (A) I quadrant (B) II quadrant (C) III quadrant (D) IV quadrant
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- (13) Direction cosines of  $x$ -axis are:- (A) 1, 1, 0 (B) 1, 0, 1 (C) 1, 0, 0 (D) 0, 0, 1
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- (20) If  $f(x) = x^{10}$ , then  $f''(1) =$  (A) 90 (B) 9 (C) 10 (D) 100

Paper Code

2019 (A)

Roll No: \_\_\_\_\_

Number: 4198

INTERMEDIATE PART-II (12<sup>th</sup> CLASS)

MATHEMATICS PAPER-II

TIME ALLOWED: 30 Minutes

GROUP-II

OBJECTIVE

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) If  $f(x) = 2^{2x}$ , then  $f'(x) =$   
 (A)  $2^{2x-1}$  (B)  $2^{2x} \ln 2$  (C)  $2^{2x+1} \ln 2$  (D)  $\frac{2^{2x}}{\ln 2}$
- (2)  $\frac{d}{dx} \left( \cos^{-1} \frac{x}{a} \right) =$   
 (A)  $\frac{1}{1-x^2}$  (B)  $\frac{1}{1+x^2}$  (C)  $\frac{1}{\sqrt{a^2-x^2}}$  (D)  $\frac{-1}{\sqrt{a^2-x^2}}$
- (3) If  $f(x) = x^{10}$ , then  $f''(1) =$  (A) 90 (B) 9 (C) 10 (D) 100
- (4)  $\int \frac{1}{x^2} dx =$  (A)  $\ln x + c$  (B)  $\ln x^2 + c$  (C)  $\frac{-2}{x^3} + c$  (D)  $\frac{-1}{x} + c$
- (5)  $\int \tan \frac{\pi}{4} dx =$  (A)  $\ln \left( \sin \frac{\pi}{4} \right) + c$  (B)  $x + c$  (C)  $\sec^2 \frac{\pi}{4}$  (D) 1
- (6)  $\int \sec^2 2x dx =$  (A)  $\frac{1}{2} \tan 2x$  (B)  $\tan 2x$  (C)  $\frac{1}{2} \tan x$  (D)  $2 \tan 2x$
- (7)  $\int_0^{\frac{3\pi}{2}} \cos x dx =$  (A) 0 (B) 1 (C) -1 (D) 2
- (8) Distance of line  $5x + 12y + 39 = 0$  from  $(0, 0)$  is:- (A) 3 (B) 5 (C) 12 (D) 39
- (9) Equation of horizontal line through  $(a, b)$  is:-  
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- (10) The line  $ax + by + c = 0$  will represent equation of straight line parallel to  $y$ -axis if:-  
 (A)  $a = 0$  (B)  $b = 0$  (C)  $c = 0$  (D)  $a = b$
- (11) Point  $\left( +\frac{3}{7}, -\frac{5}{7} \right)$  lies in:- (A) I quadrant (B) II quadrant (C) III quadrant (D) IV quadrant
- (12) The point  $(1, 2)$  satisfies the inequality:-  
 (A)  $x + 2y > 3$  (B)  $x - 2y > 3$  (C)  $x - 2y > 5$  (D)  $x + 2y < 3$
- (13) Radius of circle  $x^2 + y^2 + 4x + 2y - 4 = 0$  is:- (A) 3 (B) 2 (C) 4 (D) 1
- (14) Latus rectum of parabola  $x^2 = 8y$  is:-  
 (A)  $y = -2$  (B)  $y = 2$  (C)  $x = 2$  (D)  $x = -2$
- (15) Major axis of ellipse  $\frac{x^2}{8} + \frac{y^2}{12} = 1$  is:- (A)  $2\sqrt{3}$  (B) 8 (C)  $4\sqrt{3}$  (D) 5
- (16) Direction cosines of  $x$ -axis are:- (A) 1, 1, 0 (B) 1, 0, 1 (C) 1, 0, 0 (D) 0, 0, 1
- (17)  $[ \underline{k} \ \underline{i} \ \underline{j} ] =$  (A) 3 (B) 0 (C) -2 (D) 1
- (18) If  $f(x) = x^2 + \cos x$ , then  $f(x)$  is:-  
 (A) Constant function (B) Even function (C) Odd function (D) Linear function
- (19) If  $f(x) = x^3 - 2x^2 + 4x - 1$ , then  $f(-2) =$  (A) 14 (B) -14 (C) -25 (D) 25
- (20)  $\frac{d}{dx} (4x + 7)^9 =$   
 (A)  $36(4x + 7)^8$  (B)  $36(4x + 7)^9$  (C)  $28(4x + 7)^8$  (D)  $63(4x + 7)^8$

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BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN  
OBJECTIVE KEY FOR INTERMEDIATE ANNUAL EXAMINATION, 2019

Name of Subject: Maths

Session: \_\_\_\_\_

Group: 1st

Group: 2nd

Note: F.C mean full credit

Q. Nos	Paper Code 4191	Paper Code 4193	Paper Code 4195	Paper Code 4197
1	C	A	A	A
2	B	C	B	C
3	B	D	F.C	C
4	D	A	B	A
5	A	C	A	B
6	C	C	A	F.C
7	C	B	C	B
8	A	B	D	A
9	B	D	A	A
10	F.C	A	C	C
11	B	C	D	D
12	A	C	A	A
13	A	A	C	C
14	C	B	C	D
15	D	F.C	B	A
16	A	B	B	C
17	C	A	D	C
18	D	A	A	B
19	A	C	C	B
20	C	D	C	D

Q. Nos	Paper Code 4192	Paper Code 4194	Paper Code 4196	Paper Code 4198
1	B	C	D	C
2	C	A	B	D
3	A	B	A	A
4	C	B	C	D
5	D	D	A	B
6	A	A	B	A
7	D	A	B	C
8	B	F.C	D	A
9	A	C	A	B
10	C	C	A	B
11	A	D	F.C	D
12	B	B	C	A
13	B	C	C	A
14	D	A	D	F.C
15	A	C	B	C
16	A	D	C	C
17	F.C	A	A	D
18	C	D	C	B
19	C	B	D	C
20	D	A	A	A

Key

ہم نے مضمون ریاضی پرچہ II گروپ سکیم انٹرمیڈیٹ امتحان 2019 کا سوالیہ پرچہ انتہائی معروضی (Subjective & Objective) کو بنظر عین چیک کر لیا ہے یہ پرچہ Syllabus کے عین مطابق Set کیا گیا ہے۔ اس سوالیہ پرچہ میں کسی قسم کی کوئی غلطی نہ ہے۔ ہم نے سوالیہ پرچہ کا اردو اور انگریزی Version بھی چیک کر لیا ہے۔ یہ Version آپس میں مطابقت رکھتے ہیں۔ نیز اس پرچہ کی معروضی (MCQs) Key کی بابت تصدیق کی جاتی ہے کہ اس میں بھی کسی قسم کی کوئی غلطی نہ ہے۔ مزید یہ کہ ہم نے Key بنانے سے متعلق دفتر کی جانب سے تیار کردہ ہدایات وصول کر کے ان کا بغور مطالعہ کر لیا ہے اور ان کی روشنی میں Key بنائی ہے۔ نیز سب ایگزامینرز کیلئے تفصیلی مارکنگ ہدایات / مارکنگ سکیم Rubrics بھی تیار کر دی گئی ہیں۔

Prepared & Checked By:

Dated: 20-05-2019

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Re-Checked By ہم نے درج بالا سوالیہ پرچہ (انتہائی + معروضی) معروضی "Key" اور ہدایات کے حوالہ سے مکمل طور پر چیک کر لیا ہے۔ کسی قسم کی کوئی غلطی نہ ہے۔

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تاریخ