

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN.
OBJECTIVE KEY FOR INTERMEDIATE 1st ANNUAL EXAMINATION, 2025

Name of Subject: Mathematics (12) Group: I

Q. Nos	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer
1	B	π	B	$-\ln 2$	B	$e-1$	A	$h=0$
2	A	circle	D	$-\frac{1}{x}$	D	2	C	$c < -5$
3	D	Constant	C	$\frac{x}{y}$	A	-1	D	$e=1$
4	C	1	A	$\frac{1}{9} e^{9x} + c$	C	$\pi/4$	C	1
5	B	$-\ln 2$	B	$e-1$	D	(0,0)	D	3
6	D	$-\frac{1}{x}$	D	2	C	(1,1)	C	0
7	C	$\frac{x}{y}$	A	-1	A	$h=0$	B	π
8	A	$\frac{1}{9} e^{9x} + c$	C	$\pi/4$	C	$c < -5$	A	circle
9	B	$e-1$	D	(0,0)	D	$e=1$	D	Constant
10	D	2	C	(1,1)	C	1	C	1
11	A	-1	A	$h=0$	D	3	B	$-\ln 2$
12	C	$\pi/4$	C	$c < -5$	C	0	D	$-\frac{1}{x}$
13	D	(0,0)	D	$e=1$	B	π	C	$\frac{x}{y}$
14	C	(1,1)	C	1	A	circle	A	$\frac{1}{9} e^{9x} + c$
15	A	$h=0$	D	3	D	Constant	B	$e-1$
16	C	$c < -5$	C	0	C	1	D	2
17	D	$e=1$	B	π	B	$-\ln 2$	A	-1
18	C	1	A	circle	D	$-\frac{1}{x}$	C	$\pi/4$
19	D	3	D	Constant	C	$\frac{x}{y}$	D	(0,0)
20	C	0	C	1	A	$\frac{1}{9} e^{9x} + c$	C	(1,1)
Cross Check	A B C D		A B C D		A B C D		A B C D	
Total	4 3 7 6		4 3 7 6		4 3 7 6		4 3 7 6	

Key برائے ریاضی اولیہ پانچواں سال

یہ Key (Subjective & Objective) کو بغور پیش چیک کر لیا ہے یہ پرچہ Syllabus کے عین مطابق Set کیا گیا ہے۔ اس سوالیہ پرچہ میں کسی قسم کی غلطی نہ ہے۔ ہم نے اس پرچہ کو دو بار اور آخری بار بھی چیک کر لیا ہے۔ یہ Version آپس میں مطابقت رکھتا ہے۔ نیز اس پرچہ کی مشقی (MCQs) Key کی بہت قدرتی کی جاتی ہے۔ اس میں کسی قسم کی کوئی غلطی نہ ہے۔ مزید یہ کہ ہم نے Key بنانے سے متعلق ذرا کی جانب سے تیار کردہ ہدایات حاصل کر کے ان کو اپنے اسٹاکس میں لیا ہے اور ان کی روشنی میں Key بنائی ہے۔ نیز سب ایڈمز اور اسکیمز کے تفصیلی مارکس ہدایات / مارکس اسکیم / Rubrics بھی تیار کر دی گئی ہیں۔

Prepared & Checked By:

Dated: 13-5-25

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Re-Checked By: (ایڈمز + معروضی) اس مشقی "Key" میں ہدایات کے حالات سے مکمل طور پر متماثل کر دی ہے۔ کسی قسم کی کوئی غلطی نہ ہے۔

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INTERMEDIATE PART-II (12 th Class)		2025 (1 st -A)	Roll No: _____
MATHEMATICS PAPER-II GROUP-I			
TIME ALLOWED: 2.30 Hours		SUBJECTIVE	MAXIMUM MARKS: 80
NOTE: Write same question number and its parts number on answer book, as given in the question paper.			
SECTION-I			
2. Attempt any eight parts.			8 × 2 = 16
(i)	Evaluate $\lim_{x \rightarrow 1} \frac{x^3 - 3x^2 + 3x - 1}{x^3 - x}$	(ii)	Determine whether the given function f is even or odd. $f(x) = \frac{x^3 - x}{x^2 + 1}$
(iii)	Find $f^{-1}(-1)$, when $f(x) = 3x^3 + 7$		
(iv)	Discuss the continuity of $f(x)$ at $x = c$, where $f(x) = \begin{cases} 3x-1, & \text{if } x < 1 \\ 4, & \text{if } x = 1 \\ 2x, & \text{if } x > 1 \end{cases}$, $c = 1$	(v)	Prove that $\cosh^2 x - \sinh^2 x = 1$
		(vi)	Differentiate $\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)^2$ w.r.t x
(vii)	Find $\frac{dy}{dx}$, if $x^2 - 4xy - 5y = 0$	(viii)	Differentiate $\sin^3 x$ w.r.t $\cos^2 x$
(ix)	Expand $f(x) = \frac{1}{1+x}$ in the Maclaurin Series.	(x)	Find the extreme values for the function defined as $f(x) = 3x^2 - 4x + 5$
(xi)	Find y_2 , if $x = at^2$, $y = bt^4$	(xii)	Find $\frac{dy}{dx}$, if $y = \cosh^{-1}(\sec x)$, $0 \leq x \leq \frac{\pi}{2}$
3. Attempt any eight parts.			8 × 2 = 16
(i)	Find δy and dy in the given $y = x^2 + 2x$ when x changes from 2 to 1.8.	(ii)	Evaluate the given integral. $\int \frac{(1-\sqrt{x})^2}{\sqrt{x}} dx$, ($x > 0$)
(iii)	Evaluate $\int \frac{e^x}{e^x + 3} dx$	(iv)	Evaluate $\int e^{-x}(\cos x - \sin x) dx$
(v)	Evaluate $\int_{-1}^3 (x^3 + 3x^2) dx$	(vi)	What is order of a differential equation give an example?
		(vii)	Solve the differential equation $\frac{dy}{dx} = \frac{y^2 + 1}{e^{-x}}$
(viii)	Transform the equation $5x - 12y + 39 = 0$ into slope intercept form.		
(ix)	Find h such that the points $A(h, 1)$, $B(2, 7)$ and $C(-6, -7)$ are vertices of a right triangle with right angle at the vertex A .		
(x)	Find K so that the line joining $A(7, 3)$; $B(K, -6)$ and the line joining $C(-4, 5)$; $D(-6, 4)$ are perpendicular.		
(xi)	Find an equation of the horizontal line through $(7, -9)$		
(xii)	Check whether the lines $4x - 3y - 8 = 0$; $3x - 4y - 6 = 0$; $x - y - 2 = 0$ are concurrent.		
4. Attempt any nine parts.			9 × 2 = 18
(i)	Define Linear inequality.	(ii)	Draw the graph $3x - 2y \geq 6$
(iii)	Write standard form of equation of a circle.		
(iv)	Check the position of point $(5, 6)$ with respect to circle $2x^2 + 2y^2 + 12x - 8y + 1 = 0$		
(v)	Write an equation of parabola with focus $(-3, 1)$, directrix $x = 3$		
(vi)	Find the focus and vertex of $y^2 = 8x$	(vii)	Find eccentricity of hyperbola $x^2 - y^2 = 9$
(viii)	If $\vec{u} = 2\hat{i} - 7\hat{j}$, $\vec{v} = \hat{i} - 6\hat{j}$, $\vec{w} = -\hat{i} + \hat{j}$ find the value of $2\vec{u} - 3\vec{v} + 4\vec{w}$		
(ix)	Find a vector whose magnitude is 4 and parallel to the vector $2\hat{i} - 3\hat{j} + 6\hat{k}$		
(x)	Find $\underline{a} \times \underline{b}$ if $\underline{a} = 2\hat{i} - \hat{j} - \hat{k}$, $\underline{b} = 4\hat{i} + 2\hat{j} - \hat{k}$		
(xi)	Calculate work done if force is $\underline{F} = \hat{i} + 3\hat{j} + 5\hat{k}$ and displacement $\underline{d} = 2\hat{i} + 4\hat{j} - \hat{k}$		
(xii)	Find the value of $[\hat{i} \ \hat{i} \ \hat{k}]$	(xiii)	Find the projection of vector $\vec{v} = a\hat{i} + b\hat{j} + c\hat{k}$ along vector $\hat{i}$
SECTION-II			
NOTE: Attempt any three questions.			3 × 10 = 30
5.(a)	Define continuous function and discuss the continuity of function $f(x) = \begin{cases} \frac{x^2 - 9}{x - 3}, & \text{if } x \neq 3 \\ 6, & \text{if } x = 3 \end{cases}$ at $x = 3$		
(b)	Find $\frac{dy}{dx}$ by making suitable substitution if $y = \sqrt{\frac{1-x}{1+x}}$		
6.(a)	Show that $y = \frac{\ln x}{x}$ has maximum value at $x = e$	(b)	Evaluate $\int \frac{1}{\sqrt{a^2 + x^2}} dx$, $a > 0$
7.(a)	Solve the differential equation $\sec^2 x \tan y dx + \sec^2 y \tan x dy = 0$		
(b)	Minimize $z = 3x + y$, subject to the constraints $3x + 5y \geq 15$, $x + 6y \geq 9$, $x \geq 0$, $y \geq 0$		
8.(a)	Find the equations of tangent to the circle $x^2 + y^2 = 2$ parallel to the line $x - 2y + 1 = 0$		
(b)	If two vertices of an equilateral triangle are $A(-3, 0)$ and $B(3, 0)$. Find the third vertex. How many such triangles are possible?		
9.(a)	Find centre, foci, vertices, eccentricity and equation of directrices $\frac{y^2}{4} - x^2 = 1$	(b)	Prove that $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$

Paper Code Number: 4191		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
MATHEMATICS PAPER-II GROUP-I					
TIME ALLOWED: 30 Minutes		OBJECTIVE		MAXIMUM MARKS: 20	
Q.No.1		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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.			
S.#	QUESTIONS	A	B	C	D
1	The area of a unit circle is _____.	2π	π	π^2	0
2	$x = a \cos t$ and $y = a \sin t$ are parametric equations of _____.	Circle	Parabola	Ellipse	Hyperbola
3	If $\frac{d}{dx} f(x) = 0$, then $f(x)$ is a _____ function.	Linear	Quadratic	Identity	Constant
4	The derivative of $\sin x$ w.r.t. $\sin x$ is _____.	$\sin x$	$\cos x$	1	0
5	If $f(x) = 2^{\cos x}$, then $f'(\pi/2) =$ _____.	$2 \ln 2$	$-\ln 2$	$-2 \ln 2$	$\ln 2$
6	The derivative of $\ln\left(\frac{1}{x}\right)$ w.r.t. x is _____.	$\frac{1}{x}$	$-x$	x	$-\frac{1}{x}$
7	$\frac{ydx - xdy}{y^2}$ is the differential of _____.	$x + y$	$x - y$	$\frac{x}{y}$	$\frac{y}{x}$
8	$\int e^{9x} dx =$ _____	$\frac{1}{9} e^{9x} + c$	$9e^{9x} + c$	$e^{9x} + c$	$-e^{9x} + c$
9	$\int_0^{\pi/2} e^{\sin x} \cos x dx =$ _____	e	$e - 1$	$e + 1$	$1 - e$
10	The order of the differential equation $\frac{d^2 y}{dx^2} - \left(\frac{dy}{dx}\right)^3 + 2x = 0$ is _____.	1	4	3	2
11	If the distance between $A(0, -2)$ and $B(0, x)$ is 1, then $x =$ _____	-1	0	1	3
12	If the slope of the line is 1, then its inclination will be _____.	0	$\pi/6$	$\pi/4$	$\pi/3$
13	The point of intersection of the lines $x + y = 0$ and $x - y = 0$ is _____.	$(-1, -1)$	$(-1, 0)$	$(0, 1)$	$(0, 0)$
14	Which one of the given is a feasible solution of $2x + y \leq 6$?	$(-1, -1)$	$(-1, 0)$	$(1, 1)$	$(2, -1)$
15	$x^2 + y^2 + 2hxy + 2gx + 2fy + c = 0$ represents the equation of the circle if _____.	$h = 0$	$g = 0$	$f = 0$	$c = 0$
16	If the point $(1, 1)$ lies inside the circle $x^2 + y^2 + 2x + y + c = 0$, then:	$c = -5$	$c > -5$	$c < -5$	$c = 0$
17	For parabola, the value of eccentricity is _____.	$e = 0$	$e < 1$	$e > 1$	$e = 1$
18	The magnitude of the vector $\frac{1}{\sqrt{3}}\underline{i} + \frac{1}{\sqrt{3}}\underline{j} + \frac{1}{\sqrt{3}}\underline{k}$ is _____.	$\frac{3}{\sqrt{3}}$	$\frac{\sqrt{3}}{3}$	1	$3\sqrt{3}$
19	$3\underline{j} \cdot \underline{k} \times \underline{i} =$ _____	0	1	$\underline{k}$	3
20	The projection of $\underline{i}$ along $\underline{j}$ is:	$\underline{k}$	-1	0	$-\underline{k}$

Paper Code Number: 4193		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
MATHEMATICS PAPER-II GROUP-I					
TIME ALLOWED: 30 Minutes		OBJECTIVE		MAXIMUM MARKS: 20	
Q.No.1	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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	If $f(x)=2^{\cos x}$, then $f'(\pi/2) =$ _____	$2 \ln 2$	$-\ln 2$	$-2 \ln 2$	$\ln 2$
2	The derivative of $\ln\left(\frac{1}{x}\right)$ w.r.t. x is _____.	$\frac{1}{x}$	$-x$	$\dot{x}$	$-\frac{1}{x}$
3	$\frac{ydx - xdy}{y^2}$ is the differential of _____.	$x + y$	$x - y$	$\frac{x}{y}$	$\frac{y}{x}$
4	$\int e^{9x} dx =$ _____	$\frac{1}{9} e^{9x} + c$	$9e^{9x} + c$	$e^{9x} + c$	$-e^{9x} + c$
5	$\int_0^{\pi/2} e^{\sin x} \cos x dx =$ _____	e	$e - 1$	$e + 1$	$1 - e$
6	The order of the differential equation $\frac{d^2 y}{dx^2} - \left(\frac{dy}{dx}\right)^3 + 2x = 0$ is _____.	1	4	3	2
7	If the distance between $A(0, -2)$ and $B(0, x)$ is 1, then $x =$ _____	-1	0	1	3
8	If the slope of the line is 1, then its inclination will be _____.	0	$\pi/6$	$\pi/4$	$\pi/3$
9	The point of intersection of the lines $x + y = 0$ and $x - y = 0$ is _____.	$(-1, -1)$	$(-1, 0)$	$(0, 1)$	$(0, 0)$
10	Which one of the given is a feasible solution of $2x + y \leq 6$?	$(-1, -1)$	$(-1, 0)$	$(1, 1)$	$(2, -1)$
11	$x^2 + y^2 + 2hxy + 2gx + 2fy + c = 0$ represents the equation of the circle if _____.	$h = 0$	$g = 0$	$f = 0$	$c = 0$
12	If the point $(1, 1)$ lies inside the circle $x^2 + y^2 + 2x + y + c = 0$, then:	$c = -5$	$c > -5$	$c < -5$	$c = 0$
13	For parabola, the value of eccentricity is _____.	$e = 0$	$e < 1$	$e > 1$	$e = 1$
14	The magnitude of the vector $\frac{1}{\sqrt{3}}\underline{i} + \frac{1}{\sqrt{3}}\underline{j} + \frac{1}{\sqrt{3}}\underline{k}$ is _____.	$\frac{3}{\sqrt{3}}$	$\frac{\sqrt{3}}{3}$	1	$3\sqrt{3}$
15	$3\underline{j} \cdot \underline{k} \times \underline{i} =$ _____	0	1	$\underline{k}$	3
16	The projection of $\underline{i}$ along $\underline{j}$ is:	$\underline{k}$	-1	0	$-\underline{k}$
17	The area of a unit circle is _____.	2π	π	π^2	0
18	$x = a \cos t$ and $y = a \sin t$ are parametric equations of _____.	Circle	Parabola	Ellipse	Hyperbola
19	If $\frac{d}{dx} f(x) = 0$, then $f(x)$ is a _____ function.	Linear	Quadratic	Identity	Constant
20	The derivative of $\sin x$ w.r.t. $\sin x$ is _____.	$\sin x$	$\cos x$	1	0

Paper Code Number: 4195		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
MATHEMATICS PAPER-II GROUP-I					
TIME ALLOWED: 30 Minutes		OBJECTIVE		MAXIMUM MARKS: 20	
Q.No.1	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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	$\int_0^{\pi/2} e^{\sin x} \cos x dx = \underline{\hspace{2cm}}$	e	$e - 1$	$e + 1$	$1 - e$
2	The order of the differential equation $\frac{d^2 y}{dx^2} - \left(\frac{dy}{dx}\right)^3 + 2x = 0$ is _____.	1	4	3	2
3	If the distance between $A(0, -2)$ and $B(0, x)$ is 1, then $x = \underline{\hspace{2cm}}$	-1	0	1	3
4	If the slope of the line is 1, then its inclination will be _____.	0	$\pi/6$	$\pi/4$	$\pi/3$
5	The point of intersection of the lines $x + y = 0$ and $x - y = 0$ is _____.	$(-1, -1)$	$(-1, 0)$	$(0, 1)$	$(0, 0)$
6	Which one of the given is a feasible solution of $2x + y \leq 6$?	$(-1, -1)$	$(-1, 0)$	$(1, 1)$	$(2, -1)$
7	$x^2 + y^2 + 2hxy + 2gx + 2fy + c = 0$ represents the equation of the circle if _____.	$h = 0$	$g = 0$	$f = 0$	$c = 0$
8	If the point $(1, 1)$ lies inside the circle $x^2 + y^2 + 2x + y + c = 0$, then:	$c = -5$	$c > -5$	$c < -5$	$c = 0$
9	For parabola, the value of eccentricity is _____.	$e = 0$	$e < 1$	$e > 1$	$e = 1$
10	The magnitude of the vector $\frac{1}{\sqrt{3}}\underline{i} + \frac{1}{\sqrt{3}}\underline{j} + \frac{1}{\sqrt{3}}\underline{k}$ is _____.	$\frac{3}{\sqrt{3}}$	$\frac{\sqrt{3}}{3}$	1	$3\sqrt{3}$
11	$3\underline{j} \cdot \underline{k} \times \underline{i} = \underline{\hspace{2cm}}$	0	1	$\underline{k}$	3
12	The projection of $\underline{i}$ along $\underline{j}$ is:	$\underline{k}$	-1	0	$-\underline{k}$
13	The area of a unit circle is _____.	2π	π	π^2	0
14	$x = a \cos t$ and $y = a \sin t$ are parametric equations of _____.	Circle	Parabola	Ellipse	Hyperbola
15	If $\frac{d}{dx} f(x) = 0$, then $f(x)$ is a _____ function.	Linear	Quadratic	Identity	Constant
16	The derivative of $\sin x$ w.r.t. $\sin x$ is _____.	$\sin x$	$\cos x$	1	0
17	If $f(x) = 2^{\cos x}$, then $f'(\pi/2) = \underline{\hspace{2cm}}$	$2 \ln 2$	$-\ln 2$	$-2 \ln 2$	$\ln 2$
18	The derivative of $\ln\left(\frac{1}{x}\right)$ w.r.t. x is _____.	$\frac{1}{x}$	$-x$	x	$-\frac{1}{x}$
19	$\frac{ydx - xdy}{y^2}$ is the differential of _____.	$x + y$	$x - y$	$\frac{x}{y}$	$\frac{y}{x}$
20	$\int e^{9x} dx = \underline{\hspace{2cm}}$	$\frac{1}{9}e^{9x} + c$	$9e^{9x} + c$	$e^{9x} + c$	$-e^{9x} + c$

Paper Code Number: 4197		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
MATHEMATICS PAPER-II GROUP-I					
TIME ALLOWED: 30 Minutes.		OBJECTIVE		MAXIMUM MARKS: 20	
Q.No.1	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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	$x^2 + y^2 + 2hxy + 2gx + 2fy + c = 0$ represents the equation of the circle if _____.	$h = 0$	$g = 0$	$f = 0$	$c = 0$
2	If the point (1, 1) lies inside the circle $x^2 + y^2 + 2x + y + c = 0$, then:	$c = -5$	$c > -5$	$c < -5$	$c = 0$
3	For parabola, the value of eccentricity is _____.	$e = 0$	$e < 1$	$e > 1$	$e = 1$
4	The magnitude of the vector $\frac{1}{\sqrt{3}}\underline{i} + \frac{1}{\sqrt{3}}\underline{j} + \frac{1}{\sqrt{3}}\underline{k}$ is _____.	$\frac{3}{\sqrt{3}}$	$\frac{\sqrt{3}}{3}$	1	$3\sqrt{3}$
5	$3\underline{j} \cdot \underline{k} \times \underline{i} =$ _____	0	1	$\underline{k}$	3
6	The projection of $\underline{i}$ along $\underline{j}$ is:	$\underline{k}$	-1	0	$-\underline{k}$
7	The area of a unit circle is _____.	2π	π	π^2	0
8	$x = a \cos t$ and $y = a \sin t$ are parametric equations of _____.	Circle	Parabola	Ellipse	Hyperbola
9	If $\frac{d}{dx} f(x) = 0$, then $f(x)$ is a _____ function.	Linear	Quadratic	Identity	Constant
10	The derivative of $\sin x$ w.r.t. $\sin x$ is _____.	$\sin x$	$\cos x$	1	0
11	If $f(x) = 2^{\cos x}$, then $f'\left(\frac{\pi}{2}\right) =$ _____	$2 \ln 2$	$-\ln 2$	$-2 \ln 2$	$\ln 2$
12	The derivative of $\ln\left(\frac{1}{x}\right)$ w.r.t. x is _____.	$\frac{1}{x}$	$-x$	x	$-\frac{1}{x}$
13	$\frac{ydx - xdy}{y^2}$ is the differential of _____.	$x + y$	$x - y$	$\frac{x}{y}$	$\frac{y}{x}$
14	$\int e^{9x} dx =$ _____	$\frac{1}{9}e^{9x} + c$	$9e^{9x} + c$	$e^{9x} + c$	$-e^{9x} + c$
15	$\int_0^{\pi/2} e^{\sin x} \cos x dx =$ _____	e	$e - 1$	$e + 1$	$1 - e$
16	The order of the differential equation $\frac{d^2 y}{dx^2} - \left(\frac{dy}{dx}\right)^3 + 2x = 0$ is _____.	1	4	3	2
17	If the distance between $A(0, -2)$ and $B(0, x)$ is 1, then $x =$ _____	-1	0	1	3
18	If the slope of the line is 1, then its inclination will be _____.	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$
19	The point of intersection of the lines $x + y = 0$ and $x - y = 0$ is _____.	$(-1, -1)$	$(-1, 0)$	$(0, 1)$	$(0, 0)$
20	Which one of the given is a feasible solution of $2x + y \leq 6$?	$(-1, -1)$	$(-1, 0)$	$(1, 1)$	$(2, -1)$

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN.
OBJECTIVE KEY FOR INTERMEDIATE 1st ANNUAL EXAMINATION, 2025

Name of Subject: Mathematics (12) Group: II

Q. Nos	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer
	4192		4194		4196		4198	
1	A	-1	A	0	D	$\frac{\sin x}{2} + c$	A	0
2	B	x^2	B	02	C	45°	B	$a \cdot b = 0$
3	B	$-\frac{1}{x}$	D	-1	B	2	A	x
4	D	$\frac{1}{1-x^2}$	C	14	A	2	D	-1
5	A	0	B	$y = ce^x$	B	(1, -2)	A	-1
6	B	(0, 2)	D	$\frac{\sin x}{2} + c$	D	(2, 0)	B	x^2
7	D	-1	C	45°	B	$y - 4 = 0$	B	$-\frac{1}{x}$
8	C	14	B	2	A	0	D	$\frac{1}{1-x^2}$
9	B	$y = ce^x$	A	2	B	$a \cdot b = 0$	A	0
10	D	$\frac{\sin x}{2} + c$	B	(1, -2)	A	x	B	(0, 2)
11	C	45°	D	(2, 0)	D	-1	D	-1
12	B	2	B	$y - 4 = 0$	A	-1	C	14
13	A	2	A	$= 0$	B	x^2	B	$y = ce^x$
14	B	(1, -2)	B	$a \cdot b = 0$	B	$-\frac{1}{x}$	D	$\frac{\sin x}{2} + c$
15	D	(2, 0)	A	x	D	$\frac{1}{1-x^2}$	C	45°
16	B	$y - 4 = 0$	D	-1	A	0	B	2
17	A	0	A	-1	B	(0, 2)	A	2
18	B	$a \cdot b = 0$	B	x^2	D	-1	B	(1, -2)
19	A	x	B	$-\frac{1}{x}$	C	14	D	(2, 0)
20	D	-1	D	$\frac{1}{1-x^2}$	B	$y = ce^x$	B	$y - 4 = 0$
Gross Check	A B C D		A B C D		A B C D		A B C D	
Total	5 8 2 5		5 8 2 5		5 8 2 5		5 8 2 5	

Key کی تصدیق کے لیے اس سوالیہ پرچہ اور مارکنگ کیج

یہ سوالیہ پرچہ (Subjective & Objective) کو بغیر غلطی 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 سرکاری (MCQs) Key کی بہت 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 کئے ہیں۔ ان ہدایات کے مطابق اس Key میں 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: 13.5.25

S.#	Name	Designation	Institution	Mobile No	Signature
1	HAJIR M-IRSHAD	A.P	Govt. College Civil Lines Multan	0300233474	
2	M. Anif	A.P	Govt Graduate College of Science Multan	030-8682996	
3	DR. M. Shahzad Akhtar	A.P	Emerson University Multan	0302-3531423	
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5	DR. M JAVED AKHAR	SSS	GHSS 138/10-R	03226171679	

ہم نے اس سوالیہ پرچہ (Subjective & Objective) کی سرکاری "Key" اور ہدایات کے حوالے سے مکمل طور پر تصدیق کر لی ہے۔ کسی قسم کی کوئی غلطی نہ ہے۔

Re-Checked By					
1	M. Adnan Anwar	A.P	Govt. W. H. College Multan	03047060318	
2	MRS. Nighat Yasmin	A.P	Govt. G. College (W), Chungi no. 14, Multan	03317039467	

INTERMEDIATE PART-II (12 th Class)		2025 (1 st -A)		Roll No:	
MATHEMATICS PAPER-II GROUP-II					
TIME ALLOWED: 2.30 Hours		SUBJECTIVE		MAXIMUM MARKS: 80	
NOTE: Write same question number and its parts number on answer book, as given in the question paper.					
SECTION-I					
2. Attempt any eight parts.				8 × 2 = 16	
(i)	Check whether the function $f(x) = \frac{x^3 - x}{x^2 + 1}$ is even or odd.		(ii)	If $f(x) = 2x + 1$, $g(x) = \frac{3}{x - 1}$, find $(g \circ f)(x)$	
(iii)	Evaluate $\lim_{x \rightarrow \infty} \left(\frac{x}{1 + x} \right)^x$		(iv)	Show that $x = at^2$, $y = 2at$ represent the equation of parabola $y^2 = 4ax$	
(v)	By definition, find the derivative of $y = 2x^2 + 1$		(vi)	Find $\frac{dy}{dx}$ when $x^2 + y^2 = 4$	
(vii)	Find $\frac{dy}{dx}$ when $y = x \cos y$		(viii)	Find the domain and range of $f(x) = \frac{x - 1}{x - 4}$	
(ix)	Find the critical values of the function $f(x) = 5 - 3x - x^3$		(x)	If $f(x) = \ln(1 + x)$, find $f'(x)$ at $x = 2$	
(xi)	Find y_2 when $y = (2x + 5)^{3/2}$	(xii)	Find two positive integers whose sum is 30 and product is maximum.		
3. Attempt any eight parts.				8 × 2 = 16	
(i)	Find δy in $y = x^2 - 1$ when x changes from 3 to 3.02.		(ii)	Evaluate $\int \frac{x}{x + 2} dx$, ($x > -2$)	
(iii)	Evaluate $\int \frac{e^{2x} + e^x}{e^x} dx$		(iv)	Evaluate $\int \ln x dx$	
(v)	Find the area between the x -axis and the curve $y = x^2 + 1$ from $x = 1$ to $x = 2$		(vi)	Solve $x \frac{dy}{dx} = 1 + y$	
(vii)	Evaluate $\int e^x \left(\frac{1}{x} + \ln x \right) dx$		(viii)	Show that the points $A(-1, 2)$, $B(7, 5)$, $C(2, -6)$ are the vertices of a right triangle.	
(ix)	Find h such that $A(-1, h)$, $B(3, 2)$, $C(7, 3)$ are collinear.				
(x)	The coordinates of a point P are $(-6, 9)$. The axes are translated through the point $O'(-3, 2)$. Find the coordinates of P referred to the new axes.				
(xi)	Write down an equation of the line which cuts the X -axis at $(2, 0)$ and Y -axis at $(0, -4)$		(xii)	Find the distance from the point $P(6, -1)$ to the line $6x - 4y + 9 = 0$	
4. Attempt any nine parts.				9 × 2 = 18	
(i)	Graph the solution set of $3y - 4 \leq 0$ in xy -plane.		(ii)	Define feasible region.	
(iii)	Find centre of circle $5x^2 + 5y^2 + 14x + 12y - 16 = 0$				
(iv)	Determine whether the point $P(-5, 6)$ lies outside, on or inside the circle $x^2 + y^2 + 4x - 6y - 12 = 0$				
(v)	Find vertex of parabola $y^2 = -8(x - 3)$		(vi)	Find centre, foci of ellipse $9x^2 + y^2 = 18$	
(vii)	Find centre, vertices of hyperbola $\frac{y^2}{16} - \frac{x^2}{9} = 1$		(viii)	Find a unit vector in the direction of vector $\underline{v} = \frac{1}{2}\underline{i} + \frac{\sqrt{3}}{2}\underline{j}$	
(ix)	If $\underline{u} = 2\underline{i} + 3\underline{j} + \underline{k}$, $\underline{v} = 4\underline{i} + 6\underline{j} + 2\underline{k}$ find $\underline{u} + 2\underline{v}$				
(x)	Find projection of $\underline{b}$ along $\underline{a}$ when $\underline{a} = \underline{i} - \underline{k}$, $\underline{b} = \underline{j} + \underline{k}$		(xi)	Prove that $\underline{u} \times \underline{v} = -\underline{v} \times \underline{u}$	
(xii)	Find a vector whose magnitude is 2 and is parallel to $-\underline{i} + \underline{j} + \underline{k}$				
(xiii)	Find volume of the parallelepiped for which vectors are three edges. $\underline{u} = 3\underline{i} + 2\underline{k}$, $\underline{v} = \underline{i} + 2\underline{j} + \underline{k}$, $\underline{w} = -\underline{j} + 4\underline{k}$				
SECTION-II					
NOTE: Attempt any three questions.				3 × 10 = 30	
5.(a)	Find values of m and n if the function $f(x) = \begin{cases} mx & \text{if } x < 3 \\ n & \text{if } x = 3 \\ -2x + 9 & \text{if } x > 3 \end{cases}$ is continuous at $x = 3$		(b)	Show that $\frac{dy}{dx} = \frac{y}{x}$ if $\frac{y}{x} = \tan^{-1} \frac{x}{y}$	
6.(a)	If $x = \sin \theta$, $y = \sin m\theta$ show that $(1 - x^2)y_2 - xy_1 + m^2y = 0$		(b)	Evaluate $\int e^{-x} \sin 2x dx$	
7.(a)	Evaluate $\int_1^e x \ln x dx$		(b)	Graph the solution region of the following system of linear inequalities and find the corner points. $3x + 2y \geq 6$, $x + 3y \leq 6$, $y \geq 0$	
8.(a)	Find an equation of the circle which passes through the points $A(5, 10)$, $B(6, 9)$ and $C(-2, 3)$				
(b)	Find the condition that the lines $y = m_1x + c_1$, $y = m_2x + c_2$ and $y = m_3x + c_3$, are concurrent.				
9.(a)	Find the focus, vertex and directrix of the parabola $x^2 - 4x - 8y + 4 = 0$				
(b)	Prove that the line segment joining the mid-points of two sides of a triangle is parallel to the third side and half as long.				

Paper Code Number: 4192		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
MATHEMATICS PAPER-II GROUP-II					
TIME ALLOWED: 30 Minutes			OBJECTIVE		MAXIMUM MARKS: 20
Q.No.1	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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	$\sinh^2 x - \cosh^2 x =$	-1	1	0	2
2	If $f(x) = \sqrt{x}$, then $f^{-1}(x)$ is:	x	x^2	$-x$	$\frac{1}{x}$
3	$\frac{d}{dx} \left(\ln \left(\frac{1}{x} \right) \right) =$	$\frac{1}{x}$	$-\frac{1}{x}$	$-\frac{1}{x^2}$	x^2
4	$\frac{d}{dx} (\tan^{-1} x) =$	$\frac{1}{1+x^2}$	$\frac{-1}{1+x^2}$	$\frac{-1}{1-x^2}$	$\frac{1}{1-x^2}$
5	$\frac{d^3}{dx^3} (x^2 + 1) =$	0	1	$3x^2$	$2x$
6	If $f(x) = 4 - x^2$, then $f(x)$ decreases in interval:	$(-2, 0)$	$(0, 2)$	$(-3, -2)$	$(-1, 1)$
7	$\int x^n dx = \frac{x^{n+1}}{n+1} + c$ is not valid for:	$n = 1$	$n = 0$	$n = 2$	$n = -1$
8	$\int_1^4 3\sqrt{x} dx =$	12	13	14	15
9	Solution of differential equation $\frac{dy}{dx} = -y$ is:	$y = ce^x$	$y = ce^{-x}$	$xy = c$	$y = cx$
10	$\int \sin x \cos x dx =$	$\sin x + c$	$\frac{\cos^2 x}{2} + c$	$\frac{\sin^3 x}{3} + c$	$\frac{\sin^2 x}{2} + c$
11	Inclination of a line $y = x$ is:	0°	30°	45°	60°
12	Distance of a line $y = 2$ from $(0, 0)$ is:	0	2	1	$\frac{1}{2}$
13	Equation $x^2 - xy = 0$ represents the number of straight lines:	2	1	3	4
14	$2x - y \geq 4$ is satisfied by:	$(2, 1)$	$(1, -2)$	$(0, 0)$	$(1, 1)$
15	Centre of circle $(x - 2)^2 + y^2 = 16$ is:	$(2, -2)$	$(0, 2)$	$(-2, 2)$	$(2, 0)$
16	Directrix of parabola $x^2 = -16y$ is:	$y + 4 = 0$	$y - 4 = 0$	$y + 6 = 0$	$y - 16 = 0$
17	Eccentricity of circle is:	0	1	$\frac{1}{2}$	2
18	$\vec{a}$ and $\vec{b}$ are perpendicular of:	$\vec{a} \times \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 1$	$\vec{b} \times \vec{a} = 2$
19	Projection of $\vec{v} = x\hat{i} + y\hat{j} + z\hat{k}$ along $\hat{i}$ is:	x	y	z	0
20	$\hat{i} \cdot \hat{k} \times \hat{j}$ is:	1	0	2	-1

Paper Code Number: 4194		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
MATHEMATICS PAPER-II GROUP-II					
TIME ALLOWED: 30 Minutes			OBJECTIVE	MAXIMUM MARKS: 20	
Q.No.1	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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	$\frac{d^3}{dx^3}(x^2 + 1) =$	0	1	$3x^2$	$2x$
2	If $f(x) = 4 - x^2$, then $f'(x)$ decreases in interval:	$(-2, 0)$	$(0, 2)$	$(-3, -2)$	$(-1, 1)$
3	$\int x^n dx = \frac{x^{n+1}}{n+1} + c$ is not valid for:	$n = 1$	$n = 0$	$n = 2$	$n = -1$
4	$\int_1^4 3\sqrt{x} dx =$	12	13	14	15
5	Solution of differential equation $\frac{dy}{dx} = -y$ is:	$y = ce^x$	$y = ce^{-x}$	$xy = c$	$y = cx$
6	$\int \sin x \cos x dx =$	$\sin x + c$	$\frac{\cos^2 x}{2} + c$	$\frac{\sin^3 x}{3} + c$	$\frac{\sin^2 x}{2} + c$
7	Inclination of a line $y = x$ is:	0°	30°	45°	60°
8	Distance of a line $y = 2$ from $(0, 0)$ is:	0	2	1	$\frac{1}{2}$
9	Equation $x^2 - xy = 0$ represents the number of straight lines:	2	1	3	4
10	$2x - y \geq 4$ is satisfied by:	$(2, 1)$	$(1, -2)$	$(0, 0)$	$(1, 1)$
11	Centre of circle $(x - 2)^2 + y^2 = 16$ is:	$(2, -2)$	$(0, 2)$	$(-2, 2)$	$(2, 0)$
12	Directrix of parabola $x^2 = -16y$ is:	$y + 4 = 0$	$y - 4 = 0$	$y + 6 = 0$	$y - 16 = 0$
13	Eccentricity of circle is:	0	1	$\frac{1}{2}$	2
14	$\vec{a}$ and $\vec{b}$ are perpendicular of:	$\vec{a} \times \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 1$	$\vec{b} \times \vec{a} = 2$
15	Projection of $\vec{v} = x\hat{i} + y\hat{j} + z\hat{k}$ along $\hat{i}$ is:	x	y	z	0
16	$\hat{i} \cdot \hat{k} \times \hat{j}$ is:	1	0	2	-1
17	$\sinh^2 x - \cosh^2 x =$	-1	1	0	2
18	If $f(x) = \sqrt{x}$, then $f^{-1}(x)$ is:	x	x^2	$-x$	$\frac{1}{x}$
19	$\frac{d}{dx} \left(\ln \left(\frac{1}{x} \right) \right) =$	$\frac{1}{x}$	$-\frac{1}{x}$	$-\frac{1}{x^2}$	x^2
20	$\frac{d}{dx} (\tan h^{-1} x) =$	$\frac{1}{1+x^2}$	$\frac{-1}{1+x^2}$	$\frac{-1}{1-x^2}$	$\frac{1}{1-x^2}$

Paper Code Number: 4196		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
MATHEMATICS PAPER-II GROUP-II					
TIME ALLOWED: 30 Minutes		OBJECTIVE		MAXIMUM MARKS: 20	
Q.No.1	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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	$\int \sin x \cos x \, dx =$	$\sin x + c$	$\frac{\cos^2 x}{2} + c$	$\frac{\sin^3 x}{3} + c$	$\frac{\sin^2 x}{2} + c$
2	Inclination of a line $y = x$ is:	0°	30°	45°	60°
3	Distance of a line $y = 2$ from $(0, 0)$ is:	0	2	1	$\frac{1}{2}$
4	Equation $x^2 - xy = 0$ represents the number of straight lines:	2	1	3	4
5	$2x - y \geq 4$ is satisfied by:	$(2, 1)$	$(1, -2)$	$(0, 0)$	$(1, 1)$
6	Centre of circle $(x - 2)^2 + y^2 = 16$ is:	$(2, -2)$	$(0, 2)$	$(-2, 2)$	$(2, 0)$
7	Directrix of parabola $x^2 = -16y$ is:	$y + 4 = 0$	$y - 4 = 0$	$y + 6 = 0$	$y - 16 = 0$
8	Eccentricity of circle is:	0	1	$\frac{1}{2}$	2
9	$\vec{a}$ and $\vec{b}$ are perpendicular of:	$\vec{a} \times \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 1$	$\vec{b} \times \vec{a} = 2$
10	Projection of $\vec{v} = x\hat{i} + y\hat{j} + z\hat{k}$ along $\hat{i}$ is:	x	y	z	0
11	$\hat{i} \cdot \hat{k} \times \hat{j}$ is:	1	0	2	-1
12	$\sinh^2 x - \cosh^2 x =$	-1	1	0	2
13	If $f(x) = \sqrt{x}$, then $f^{-1}(x)$ is:	x	x^2	$-x$	$\frac{1}{x}$
14	$\frac{d}{dx} \left(\ln \left(\frac{1}{x} \right) \right) =$	$\frac{1}{x}$	$-\frac{1}{x}$	$-\frac{1}{x^2}$	x^2
15	$\frac{d}{dx} (\tan h^{-1} x) =$	$\frac{1}{1+x^2}$	$\frac{-1}{1+x^2}$	$\frac{-1}{1-x^2}$	$\frac{1}{1-x^2}$
16	$\frac{d^3}{dx^3} (x^2 + 1) =$	0	1	$3x^2$	$2x$
17	If $f(x) = 4 - x^2$, then $f(x)$ decreases in interval:	$(-2, 0)$	$(0, 2)$	$(-3, -2)$	$(-1, 1)$
18	$\int x^n dx = \frac{x^{n+1}}{n+1} + c$ is not valid for:	$n = 1$	$n = 0$	$n = 2$	$n = -1$
19	$\int_1^4 3\sqrt{x} \, dx =$	12	13	14	15
20	Solution of differential equation $\frac{dy}{dx} = -y$ is:	$y = ce^x$	$y = ce^{-x}$	$xy = c$	$y = cx$

Paper Code Number: 4198		2025 (1 st -A) INTERMEDIATE PART-II (12 th Class)		Roll No:	
MATHEMATICS PAPER-II GROUP-II					
TIME ALLOWED: 30 Minutes		OBJECTIVE		MAXIMUM MARKS: 20	
Q.No.1	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, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	Eccentricity of circle is:	0	1	$\frac{1}{2}$	2
2	$\vec{a}$ and $\vec{b}$ are perpendicular of:	$\vec{a} \times \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 0$	$\vec{a} \cdot \vec{b} = 1$	$\vec{b} \times \vec{a} = 2$
3	Projection of $\vec{v} = x\hat{i} + y\hat{j} + z\hat{k}$ along $\hat{i}$ is:	x	y	z	0
4	$\hat{i} \cdot \hat{k} \times \hat{j}$ is:	1	0	2	-1
5	$\sinh^2 x - \cosh^2 x =$	-1	1	0	2
6	If $f(x) = \sqrt{x}$, then $f^{-1}(x)$ is:	x	x^2	$-x$	$\frac{1}{x}$
7	$\frac{d}{dx} \left(\ln \left(\frac{1}{x} \right) \right) =$	$\frac{1}{x}$	$-\frac{1}{x}$	$-\frac{1}{x^2}$	x^2
8	$\frac{d}{dx} (\tan^{-1} x) =$	$\frac{1}{1+x^2}$	$\frac{-1}{1+x^2}$	$\frac{-1}{1-x^2}$	$\frac{1}{1-x^2}$
9	$\frac{d^3}{dx^3} (x^2 + 1) =$	0	1	$3x^2$	$2x$
10	If $f(x) = 4 - x^2$, then $f(x)$ decreases in interval:	$(-2, 0)$	$(0, 2)$	$(-3, -2)$	$(-1, 1)$
11	$\int x^n dx = \frac{x^{n+1}}{n+1} + c$ is not valid for:	$n = 1$	$n = 0$	$n = 2$	$n = -1$
12	$\int_1^4 3\sqrt{x} dx =$	12	13	14	15
13	Solution of differential equation $\frac{dy}{dx} = -y$ is:	$y = ce^x$	$y = ce^{-x}$	$xy = c$	$y = cx$
14	$\int \sin x \cos x dx =$	$\sin x + c$	$\frac{\cos^2 x}{2} + c$	$\frac{\sin^3 x}{3} + c$	$\frac{\sin^2 x}{2} + c$
15	Inclination of a line $y = x$ is:	0°	30°	45°	60°
16	Distance of a line $y = 2$ from $(0, 0)$ is:	0	2	1	$\frac{1}{2}$
17	Equation $x^2 - xy = 0$ represents the number of straight lines:	2	1	3	4
18	$2x - y \geq 4$ is satisfied by:	$(2, 1)$	$(1, -2)$	$(0, 0)$	$(1, 1)$
19	Centre of circle $(x - 2)^2 + y^2 = 16$ is:	$(2, -2)$	$(0, 2)$	$(-2, 2)$	$(2, 0)$
20	Directrix of parabola $x^2 = -16y$ is:	$y + 4 = 0$	$y - 4 = 0$	$y + 6 = 0$	$y - 16 = 0$