

OBJECTIVE KEY FOR BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN.
INTERMEDIATE ..II.. ANNUAL EXAMINATION, 2022

Name of Subject: Mathematics

Group: 2nd

Q. Nos	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer
	4192		4194		4196		4198	
1	C	$\sqrt{e}$	D	$-\cos 2x$	D	0	D	6
2	A	$x=0$	A	$y = \tan x$	C	$\frac{-1}{x\sqrt{1-x^2}}$	B	$y=4$
3	B	-1	B	2	A	b^2-a^2	C	$(1, -1)$
4	B	Decreases	D	$\frac{1}{\sqrt{2}}$	D	$-\cos 2x$	D	$-\hat{k}$
5	D	0	C	$k^2-ab=0$	A	$y = \tan x$	A	2
6	C	$\frac{-1}{x\sqrt{1-x^2}}$	B	60°	B	2	C	$\sqrt{e}$
7	A	b^2-a^2	A	$(0, 1)$	D	$\frac{1}{\sqrt{2}}$	A	$x=0$
8	D	$-\cos 2x$	C	$(3, 1)$	C	$k^2-ab=0$	B	-1
9	A	$y = \tan x$	D	6	B	60°	B	Decreases
10	B	2	B	$y=4$	A	$(0, 1)$	D	0
11	D	$\frac{1}{\sqrt{2}}$	C	$(1, -1)$	C	$(3, 1)$	C	$\frac{-1}{x\sqrt{1-x^2}}$
12	C	$k^2-ab=0$	D	$-\hat{k}$	D	6	A	b^2-a^2
13	B	60°	A	2	B	$y=4$	D	$-\cos 2x$
14	A	$(0, 1)$	C	$\sqrt{e}$	C	$(1, -1)$	A	$y = \tan x$
15	C	$(3, 1)$	A	$x=0$	D	$-\hat{k}$	B	2
16	D	6	B	-1	A	2	D	$\frac{1}{\sqrt{2}}$
17	B	$y=4$	B	Decreases	C	$\sqrt{e}$	C	$k^2-ab=0$
18	C	$(1, -1)$	D	0	A	$x=0$	B	60°
19	D	$-\hat{k}$	C	$\frac{-1}{x\sqrt{1-x^2}}$	B	-1	A	$(0, 1)$
20	A	2	A	b^2-a^2	B	Decreases	C	$(3, 1)$

مرٹیکٹ بابت صحیح سوالیہ پرچہ امارتنگ Key

ہم نے مضمون پرچہ انشائیہ و 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 ایڈمزیزز کیلئے تفصیلی مارکنگ ہدایات / مارکنگ سکیم / Rubrics بھی تیار کر دی گئی ہیں۔

Prepared & Checked By:

Dated:

S.#	Name	Designation	Institution	Mobile No	Signature
1	Nazir Ahmad	Associate Prof.	Govt. Graduate College Mian Channu	03006883752	<i>[Signature]</i>
2	Rao Riasat Ali	Professor	Govt. Graduate College Khanpur	03326321993	<i>[Signature]</i>
3	Dr. Abdul Mueed	Assistant Professor	Emerson University	0321-631967	<i>[Signature]</i>
4	Khuorram Shahzad	Assistant Professor	Govt. Graduate College Civil Lines Multan.	03216343022	<i>[Signature]</i>
5					

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

1	Hafiz M. IRSHAD	Assistant Prof.	Govt. Emerson College	03007331974	<i>[Signature]</i>
2					
3					

OBJECTIVE KEY FOR BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN.
INTERMEDIATE ... ANNUAL EXAMINATION, 2022

Name of Subject: Mathematics.

Group: 1st

Q. Nos	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer	Paper Code	Correct Answer
1	4191	C	4193	D	4195	D	4197	C
2	D	neither even nor odd	B	$\frac{\pi}{2}$	A	$\frac{3}{5}$	B	$\frac{1}{\sqrt{1+x^2}}$
3	B	$n \times^{n-1}$	A	$x \times_1 + y \times_1 = \frac{1}{2}$	D	undefined	A	$\frac{1}{3} \tan^{-1} \frac{x}{3}$
4	D	2	A	0	B	$\frac{13}{\sqrt{29}}$	A	$\ln(e^x - 2)$
5	B	$2^x \ln 2$	B	$\frac{b \cdot a}{ a }$	A	$2x + y > 0$	C	0
6	C	$\frac{1}{\sqrt{1+x^2}}$	C	7	D	$\sqrt{8}$	D	$e^x \tan x$
7	B	$\frac{1}{3} \tan^{-1} \frac{x}{3}$	D	neither even nor odd	B	$\frac{\pi}{2}$	A	2
8	A	$\ln(e^x - 2)$	B	$n \times^{n-1}$	A	$x \times_1 + y \times_1 = a^2$	D	$\frac{3}{5}$
9	A	0	D	2	A	0	B	undefined
10	C	$e^x \tan x$	B	$2^x \ln 2$	B	$\frac{b \cdot a}{ a }$	A	$\frac{13}{\sqrt{29}}$
11	D	2	C	$\frac{1}{\sqrt{1+x^2}}$	C	7	D	$2x + y > 0$
12	A	$\frac{3}{5}$	B	$\frac{1}{3} \tan^{-1} \frac{x}{3}$	D	neither even nor odd	B	$\sqrt{8}$
13	D	undefined	A	$\ln(e^x - 2)$	B	$n \times^{n-1}$	A	$\frac{\pi}{2}$
14	B	$\frac{13}{\sqrt{29}}$	A	0	D	2	A	$x \times_1 + y \times_1 = a^2$
15	A	$2x + y > 0$	C	$e^x \tan x$	B	$2^x \ln 2$	B	0
16	D	$\sqrt{8}$	D	2	C	$\frac{1}{\sqrt{1+x^2}}$	C	$\frac{b \cdot a}{ a }$
17	B	$\frac{\pi}{2}$	A	$\frac{3}{5}$	B	$\frac{1}{3} \tan^{-1} \frac{x}{3}$	D	7
18	A	$x \times_1 + y \times_1 = a^2$	D	undefined	A	$\ln(e^x - 2)$	B	neither even nor odd
19	A	0	B	$\frac{13}{\sqrt{29}}$	A	0	D	$n \times^{n-1}$
20	B	$\frac{b \cdot a}{ a }$	A	$2x + y > 0$	C	$e^x \tan x$	B	2

مرتبہ بنیاد پر سوالیہ پرچہ / مارکنگ Key

ہم نے مضمون پرچہ (Subjective & Objective) کو بنظر عمیق 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 کیسے تفصیلی مارکنگ ہدایات / مارکنگ سکیم / Rubrics بھی تیار کر دی گئی ہیں۔

Prepared & Checked By:

Dated:

S.#	Name	Designation	Institution	Mobile No	Signature
1	Nazir Ahmad	Associate Prof.	Govt. Graduate College Mian Channu	0300 6883752	[Signature]
2	Rao Riayat Ali	Professor	Govt. College Khanewal	0332 6341953	[Signature]
3	Dr. Abdul Mueed	Assistant Professor	Emerson University	0321-6319672	[Signature]
4	Khurram Shahzad	Assistant Professor	Govt. Graduate College Civil Lines Multan.	03216343002	[Signature]
5					

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

1	Hafiz M. IRSHAD	Assistant Prof.	Emerson University	03007381999	[Signature]
2					
3					

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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) $\lim_{\theta \rightarrow 0} \frac{\sin 7\theta}{\theta}$ (A) $\frac{1}{7}$ (B) 1 (C) 7 (D) -7
- (2) The function $f(x) = (x+2)^2$ is:
(A) Even (B) Odd (C) Both even and odd (D) Neither even nor odd
- (3) $\frac{d}{dx}(x^n - 2) =$ (A) $n(x^{n-1} - 2)$ (B) nx^{n-1} (C) $(n-2)x^{n-1}$ (D) x^n
- (4) If $f(x) = \frac{1}{x^2}$ then $f'(-1) =$ (A) 1 (B) -1 (C) $\frac{1}{2}$ (D) 2
- (5) $\frac{d}{dx}(2^x) =$ (A) $x2^{x-1}$ (B) $2^x \ln 2$ (C) $\frac{2^x}{\ln 2}$ (D) $\frac{\ln 2}{2^x}$
- (6) $\frac{d}{dx}(\sin^{-1} kx) =$ (A) $\frac{1}{\sqrt{1-x^2}}$ (B) $\frac{-1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{1+x^2}}$ (D) $\frac{-1}{\sqrt{1+x^2}}$
- (7) $\int \frac{dx}{x^2+9} =$ (A) $\frac{1}{3} \sin^{-1} \frac{x}{3}$ (B) $\frac{1}{3} \tan^{-1} \frac{x}{3}$ (C) $\frac{1}{3} \cos^{-1} \frac{x}{3}$ (D) $\frac{1}{3} \cot^{-1} \frac{x}{3}$
- (8) $\int \frac{e^x}{e^x-2} dx =$
(A) $\ln(e^x-2) + c$ (B) $\ln(e^x-3) + c$ (C) e^x-2+c (D) e^x
- (9) $\int_0^x \cos x dx =$ (A) 0 (B) -1 (C) 2 (D) 1
- (10) $\int e^x(\sec^2 x + \tan x) dx =$ (A) $e^x \sec^2 x$ (B) $e^x \sec x$ (C) $e^x \tan x$ (D) $e^x \tan^2 x$
- (11) The distance of the point $(-1, 2)$ from x -axis is: (A) 1 (B) -1 (C) -2 (D) 2
- (12) Slope of the line $3x - 5y + 2 = 0$ is: (A) $\frac{3}{5}$ (B) $-\frac{3}{5}$ (C) $\frac{3}{2}$ (D) $\frac{2}{3}$
- (13) Slope of y -axis is: (A) Zero (B) 1 (C) 2 (D) Undefined
- (14) The distance of the line $2x - 5y + 13 = 0$ from the point $(0, 0)$ is:
(A) $\frac{13}{29}$ (B) $\frac{13}{\sqrt{29}}$ (C) 13 (D) 2
- (15) $(2, 1)$ is in the solution of inequality:
(A) $2x + y > 0$ (B) $x - y > 1$ (C) $3x + 5y < 3$ (D) $2x + y \geq 6$
- (16) The radius of the circle $(x-5)^2 + (y-3)^2 = 8$ is:
(A) 64 (B) 4 (C) 8 (D) $\sqrt{8}$
- (17) An angle inscribed in a semi-circle is:
(A) 0 (B) $\frac{\pi}{2}$ (C) π (D) 2π
- (18) Equation of tangent to circle $x^2 + y^2 = a^2$ at $P(x_1, y_1)$ is:
(A) $xx_1 + yy_1 = a^2$ (B) $xx_1 - yy_1 = a^2$ (C) $\frac{x}{x_1} = \frac{y}{y_1}$ (D) $\frac{x}{x_1} = \frac{-y}{y_1}$
- (19) $\hat{i} \cdot \hat{j} =$
(A) 0 (B) $\hat{i}$ (C) $\hat{j}$ (D) $\hat{k}$
- (20) The projection of a vector $\underline{b}$ along vector $\underline{a}$ is:
(A) $\frac{\underline{b} \cdot \underline{a}}{|\underline{b}|}$ (B) $\frac{\underline{b} \cdot \underline{a}}{|\underline{a}|}$ (C) $\underline{a} \cdot \underline{b}$ (D) $\frac{\underline{a}}{\underline{b}}$

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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) The radius of the circle $(x - 5)^2 + (y - 3)^2 = 8$ is:
 - (A) 64
 - (B) 4
 - (C) 8
 - (D) $\sqrt{8}$
- (2) An angle inscribed in a semi-circle is:
 - (A) 0
 - (B) $\frac{\pi}{2}$
 - (C) π
 - (D) 2π
- (3) Equation of tangent to circle $x^2 + y^2 = a^2$ at $P(x_1, y_1)$ is:
 - (A) $xx_1 + yy_1 = a^2$
 - (B) $xx_1 - yy_1 = a^2$
 - (C) $\frac{x}{x_1} = \frac{y}{y_1}$
 - (D) $\frac{x}{x_1} = \frac{-y}{y_1}$
- (4) $\hat{i} \cdot \hat{j} =$
 - (A) 0
 - (B) $\hat{i}$
 - (C) $\hat{j}$
 - (D) $\hat{k}$
- (5) The projection of a vector $\underline{b}$ along vector $\underline{a}$ is:
 - (A) $\frac{\underline{b} \cdot \underline{a}}{|\underline{b}|}$
 - (B) $\frac{\underline{b} \cdot \underline{a}}{|\underline{a}|}$
 - (C) $\underline{a} \cdot \underline{b}$
 - (D) $\frac{\underline{a}}{\underline{b}}$
- (6) $\lim_{\theta \rightarrow 0} \frac{\sin 7\theta}{\theta}$
 - (A) $\frac{1}{7}$
 - (B) 1
 - (C) 7
 - (D) -7
- (7) The function $f(x) = (x + 2)^2$ is:
 - (A) Even
 - (B) Odd
 - (C) Both even and odd
 - (D) Neither even nor odd
- (8) $\frac{d}{dx}(x^n - 2) =$
 - (A) $n(x^{n-1} - 2)$
 - (B) nx^{n-1}
 - (C) $(n - 2)x^{n-1}$
 - (D) x^n
- (9) If $f(x) = \frac{1}{x^2}$ then $f'(-1) =$
 - (A) 1
 - (B) -1
 - (C) $\frac{1}{2}$
 - (D) 2
- (10) $\frac{d}{dx}(2^x) =$
 - (A) $x2^{x-1}$
 - (B) $2^x \ln 2$
 - (C) $\frac{2^x}{\ln 2}$
 - (D) $\frac{\ln 2}{2^x}$
- (11) $\frac{d}{dx}(\sin^{-1} hx) =$
 - (A) $\frac{1}{\sqrt{1-x^2}}$
 - (B) $\frac{-1}{\sqrt{1-x^2}}$
 - (C) $\frac{1}{\sqrt{1+x^2}}$
 - (D) $\frac{-1}{\sqrt{1+x^2}}$
- (12) $\int \frac{dx}{x^2 + 9} =$
 - (A) $\frac{1}{3} \sin^{-1} \frac{x}{3}$
 - (B) $\frac{1}{3} \tan^{-1} \frac{x}{3}$
 - (C) $\frac{1}{3} \cos^{-1} \frac{x}{3}$
 - (D) $\frac{1}{3} \cot^{-1} \frac{x}{3}$
- (13) $\int \frac{e^x}{e^x - 2} dx =$
 - (A) $\ln(e^x - 2) + c$
 - (B) $\ln(e^x - 3) + c$
 - (C) $e^x - 2 + c$
 - (D) e^x
- (14) $\int_0^{\pi} \cos x dx =$
 - (A) 0
 - (B) -1
 - (C) 2
 - (D) 1
- (15) $\int e^x (\sec^2 x + \tan x) dx =$
 - (A) $e^x \sec^2 x$
 - (B) $e^x \sec x$
 - (C) $e^x \tan x$
 - (D) $e^x \tan^2 x$
- (16) The distance of the point $(-1, 2)$ from x -axis is:
 - (A) 1
 - (B) -1
 - (C) -2
 - (D) 2
- (17) Slope of the line $3x - 5y + 2 = 0$ is:
 - (A) $\frac{3}{5}$
 - (B) $\frac{-3}{5}$
 - (C) $\frac{3}{2}$
 - (D) $\frac{2}{3}$
- (18) Slope of y -axis is:
 - (A) Zero
 - (B) 1
 - (C) 2
 - (D) Undefined
- (19) The distance of the line $2x - 5y + 13 = 0$ from the point $(0, 0)$ is:
 - (A) $\frac{13}{29}$
 - (B) $\frac{13}{\sqrt{29}}$
 - (C) 13
 - (D) 2
- (20) $(2, 1)$ is in the solution of inequality:
 - (A) $2x + y > 0$
 - (B) $x - y > 1$
 - (C) $3x + 5y < 3$
 - (D) $2x + y \geq 6$

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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) The distance of the point $(-1, 2)$ from x -axis is: (A) 1 (B) -1 (C) -2 (D) 2
- (2) Slope of the line $3x - 5y + 2 = 0$ is: (A) $\frac{3}{5}$ (B) $-\frac{3}{5}$ (C) $\frac{3}{2}$ (D) $\frac{2}{3}$
- (3) Slope of y -axis is: (A) Zero (B) 1 (C) 2 (D) Undefined
- (4) The distance of the line $2x - 5y + 13 = 0$ from the point $(0, 0)$ is:
(A) $\frac{13}{29}$ (B) $\frac{13}{\sqrt{29}}$ (C) 13 (D) 2
- (5) $(2, 1)$ is in the solution of inequality:
(A) $2x + y > 0$ (B) $x - y > 1$ (C) $3x + 5y < 3$ (D) $2x + y \geq 6$
- (6) The radius of the circle $(x - 5)^2 + (y - 3)^2 = 8$ is:
(A) 64 (B) 4 (C) 8 (D) $\sqrt{8}$
- (7) An angle inscribed in a semi-circle is:
(A) 0 (B) $\frac{\pi}{2}$ (C) π (D) 2π
- (8) Equation of tangent to circle $x^2 + y^2 = a^2$ at $P(x_1, y_1)$ is:
(A) $xx_1 + yy_1 = a^2$ (B) $xx_1 - yy_1 = a^2$ (C) $\frac{x}{x_1} = \frac{y}{y_1}$ (D) $\frac{x}{x_1} = -\frac{y}{y_1}$
- (9) $\hat{i} \cdot \hat{j} =$
(A) 0 (B) $\hat{i}$ (C) $\hat{j}$ (D) $\hat{k}$
- (10) The projection of a vector $\underline{b}$ along vector $\underline{a}$ is:
(A) $\frac{\underline{b} \cdot \underline{a}}{|\underline{b}|}$ (B) $\frac{\underline{b} \cdot \underline{a}}{|\underline{a}|}$ (C) $\underline{a} \cdot \underline{b}$ (D) $\frac{\underline{a}}{\underline{b}}$
- (11) $\lim_{\theta \rightarrow 0} \frac{\sin 7\theta}{\theta} =$ (A) $\frac{1}{7}$ (B) 1 (C) 7 (D) -7
- (12) The function $f(x) = (x + 2)^2$ is:
(A) Even (B) Odd (C) Both even and odd (D) Neither even nor odd
- (13) $\frac{d}{dx}(x^n - 2) =$ (A) $n(x^{n-1} - 2)$ (B) nx^{n-1} (C) $(n - 2)x^{n-1}$ (D) x^n
- (14) If $f(x) = \frac{1}{x^2}$ then $f'(-1) =$ (A) 1 (B) -1 (C) $\frac{1}{2}$ (D) 2
- (15) $\frac{d}{dx}(2^x) =$ (A) $x2^{x-1}$ (B) $2^x \ln 2$ (C) $\frac{2^x}{\ln 2}$ (D) $\frac{\ln 2}{2^x}$
- (16) $\frac{d}{dx}(\sin^{-1} hx) =$ (A) $\frac{1}{\sqrt{1-x^2}}$ (B) $\frac{-1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{1+x^2}}$ (D) $\frac{-1}{\sqrt{1+x^2}}$
- (17) $\int \frac{dx}{x^2 + 9} =$ (A) $\frac{1}{3} \sin^{-1} \frac{x}{3}$ (B) $\frac{1}{3} \tan^{-1} \frac{x}{3}$ (C) $\frac{1}{3} \cos^{-1} \frac{x}{3}$ (D) $\frac{1}{3} \cot^{-1} \frac{x}{3}$
- (18) $\int \frac{e^x}{e^x - 2} dx =$
(A) $\ln(e^x - 2) + c$ (B) $\ln(e^x - 3) + c$ (C) $e^x - 2 + c$ (D) e^x
- (19) $\int_0^\pi \cos x dx =$ (A) 0 (B) -1 (C) 2 (D) 1
- (20) $\int e^x (\sec^2 x + \tan x) dx =$ (A) $e^x \sec^2 x$ (B) $e^x \sec x$ (C) $e^x \tan x$ (D) $e^x \tan^2 x$

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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) $\frac{d}{dx}(\sin^{-1} hx) =$ (A) $\frac{1}{\sqrt{1-x^2}}$ (B) $\frac{-1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{1+x^2}}$ (D) $\frac{-1}{\sqrt{1+x^2}}$
- (2) $\int \frac{dx}{x^2+9} =$ (A) $\frac{1}{3} \sin^{-1} \frac{x}{3}$ (B) $\frac{1}{3} \tan^{-1} \frac{x}{3}$ (C) $\frac{1}{3} \cos^{-1} \frac{x}{3}$ (D) $\frac{1}{3} \cot^{-1} \frac{x}{3}$
- (3) $\int \frac{e^x}{e^x-2} dx =$ (A) $\ln(e^x-2) + c$ (B) $\ln(e^x-3) + c$ (C) e^x-2+c (D) e^x
- (4) $\int_0^{\pi} \cos x dx =$ (A) 0 (B) -1 (C) 2 (D) 1
- (5) $\int e^x (\sec^2 x + \tan x) dx =$ (A) $e^x \sec^2 x$ (B) $e^x \sec x$ (C) $e^x \tan x$ (D) $e^x \tan^2 x$
- (6) The distance of the point $(-1, 2)$ from x -axis is: (A) 1 (B) -1 (C) -2 (D) 2
- (7) Slope of the line $3x - 5y + 2 = 0$ is: (A) $\frac{3}{5}$ (B) $-\frac{3}{5}$ (C) $\frac{3}{2}$ (D) $\frac{2}{3}$
- (8) Slope of y -axis is: (A) Zero (B) 1 (C) 2 (D) Undefined
- (9) The distance of the line $2x - 5y + 13 = 0$ from the point $(0, 0)$ is:
(A) $\frac{13}{29}$ (B) $\frac{13}{\sqrt{29}}$ (C) 13 (D) 2
- (10) $(2, 1)$ is in the solution of inequality:
(A) $2x + y > 0$ (B) $x - y > 1$ (C) $3x + 5y < 3$ (D) $2x + y \geq 6$
- (11) The radius of the circle $(x-5)^2 + (y-3)^2 = 8$ is:
(A) 64 (B) 4 (C) 8 (D) $\sqrt{8}$
- (12) An angle inscribed in a semi-circle is:
(A) 0 (B) $\frac{\pi}{2}$ (C) π (D) 2π
- (13) Equation of tangent to circle $x^2 + y^2 = a^2$ at $P(x_1, y_1)$ is:
(A) $xx_1 + yy_1 = a^2$ (B) $xx_1 - yy_1 = a^2$ (C) $\frac{x}{x_1} = \frac{y}{y_1}$ (D) $\frac{x}{x_1} = \frac{-y}{y_1}$
- (14) $\hat{i} \cdot \hat{j} =$ (A) 0 (B) $\hat{i}$ (C) $\hat{j}$ (D) $\hat{k}$
- (15) The projection of a vector $\underline{b}$ along vector $\underline{a}$ is:
(A) $\frac{\underline{b} \cdot \underline{a}}{|\underline{b}|}$ (B) $\frac{\underline{b} \cdot \underline{a}}{|\underline{a}|}$ (C) $\underline{a} \cdot \underline{b}$ (D) $\frac{\underline{a}}{\underline{b}}$
- (16) $\lim_{\theta \rightarrow 0} \frac{\sin 7\theta}{\theta} =$ (A) $\frac{1}{7}$ (B) 1 (C) 7 (D) -7
- (17) The function $f(x) = (x+2)^2$ is:
(A) Even (B) Odd (C) Both even and odd (D) Neither even nor odd
- (18) $\frac{d}{dx}(x^n - 2) =$ (A) $n(x^{n-1} - 2)$ (B) nx^{n-1} (C) $(n-2)x^{n-1}$ (D) x^n
- (19) If $f(x) = \frac{1}{x^2}$ then $f'(-1) =$ (A) 1 (B) -1 (C) $\frac{1}{2}$ (D) 2
- (20) $\frac{d}{dx}(2^x) =$ (A) $x2^{x-1}$ (B) $2^x \ln 2$ (C) $\frac{2^x}{\ln 2}$ (D) $\frac{\ln 2}{2^x}$

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 × 2 = 16

- (i) Define even function and give one example.
- (ii) If $f(x) = 2x + 1$ then find $f^{-1}(x)$
- (iii) Evaluate $\lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin^2 x}$
- (iv) If $f(x) = 2x^2 + x - 5$ then find Left hand and Right hand limits of $f(x)$ at $x = 1$
- (v) Find $\lim_{x \rightarrow -1} \left[\frac{x^3 + x^2}{x^2 - 1} \right]$
- (vi) If $y = \left(\sqrt{x} - \frac{1}{\sqrt{x}} \right)^2$ then find $\frac{dy}{dx}$
- (vii) If $x = 1 - t^2$, $y = 3t^2 - 2t^3$ then find $\frac{dy}{dx}$
- (viii) If $y = a^{\sqrt{x}}$ then find $\frac{dy}{dx}$
- (ix) If $y = \frac{x}{\ln x}$ then find $\frac{dy}{dx}$
- (x) Find y_2 if $y = \sqrt{x} + \frac{1}{\sqrt{x}}$
- (xi) Define increasing and decreasing function.
- (xii) Apply Maclaurin's series expansion to prove that $e^{2x} = 1 + 2x + \frac{4x^2}{2!} + \frac{8x^3}{3!} + \dots$

3. Attempt any eight parts.

8 × 2 = 16

- (i) Find dy of the function defined as $f(x) = x^2$ when $x = 2$ and $dx = 0.01$
- (ii) By using differentials find $\frac{dy}{dx}$ if $x + 2y^2 = 16$
- (iii) Evaluate $\int x\sqrt{x^2 - 1} dx$
- (iv) Evaluate $\int \frac{dx}{\sqrt{x+1} - \sqrt{x}}$
- (v) Evaluate $\int (\sqrt{x} + 1)^2 dx$ $x > 0$
- (vi) Evaluate $\int \frac{(1 - \sqrt{x})^2}{\sqrt{x}} dx$
- (vii) Solve the differential equation $\frac{dy}{dx} = -y$
- (viii) Find the area bounded by $\cos$ function from $x = -\frac{\pi}{2}$ to $x = \frac{\pi}{2}$
- (ix) Find the mid point of the line segment joining the two points $A(3, 1)$; $B(-2, -4)$
- (x) Find an equation of the vertical line through $(-5, 3)$
- (xi) Convert $4x + 7y - 2 = 0$ in normal form.
- (xii) Find the distance from the point $P(6, -1)$ to the line $6x - 4y + 9 = 0$

4. Attempt any nine parts.

- (i) What is a convex region?
- (ii) Graph the solution set of linear inequality in xy -plane, $3x + 7y \geq 21$
- (iii) Find the centre and radius of the circle $4x^2 + 4y^2 - 8x + 12y - 25 = 0$
- (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 the equation of tangent to the circle $x^2 + y^2 = 25$ at point $(5\cos\theta, 5\sin\theta)$
- (vi) Find the focus and directrix of the parabola $(x-1)^2 = 8(y+2)$
- (vii) Find the equation of the ellipse with vertex $(0, 4)$, focus $(0, -3)$ and centre $(0, 0)$
- (viii) Find vertices and eccentricity of hyperbola $25x^2 - 16y^2 = 400$
- (ix) Find a unit vector in the direction of $\underline{v} = -\frac{\sqrt{3}}{2}\underline{i} - \frac{1}{2}\underline{j}$
- (x) Let $\underline{v} = 3\underline{i} - 2\underline{j} + 2\underline{k}$, $\underline{w} = 5\underline{i} - \underline{j} + 3\underline{k}$ find $|3\underline{v} + \underline{w}|$
- (xi) Find a real number α so that $\underline{u} = 2\alpha\underline{i} - \underline{j} - \underline{k}$ and $\underline{v} = \underline{i} + \alpha\underline{j} + 4\underline{k}$ are perpendicular.
- (xii) If $\underline{u} = 2\underline{i} - \underline{j} + \underline{k}$ and $\underline{v} = 4\underline{i} + 2\underline{j} - \underline{k}$ find $\underline{v} \times \underline{u}$
- (xiii) Prove that $\underline{u} \cdot (\underline{v} \times \underline{w}) + \underline{v} \cdot (\underline{w} \times \underline{u}) + \underline{w} \cdot (\underline{u} \times \underline{v}) = 3\underline{u} \cdot (\underline{v} \times \underline{w})$

SECTION-II**NOTE: Attempt any three questions.****3 × 10 = 30**

5.(a) Find the $\lim_{x \rightarrow 0} \frac{1 - \cos px}{1 - \cos qx}$

(b) If $y = \sqrt{\tan x} + \sqrt{\tan x + \sqrt{\tan x}} + \dots$, prove that $(2y-1) \frac{dy}{dx} = \sec^2 x$

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

(b) Find the family of lines through the point of intersection of the lines $3x - 4y - 10 = 0$ and $x + 2y - 10 = 0$. Find the member of the family which is parallel to a line with slope $-\frac{2}{3}$.

7. (a) Solve the differential equation $2e^x \tan y dx (1 - e^x) \sec^2 y dy = 0$

(b) Maximize $f(x, y) = 2x + 5y$ subject to the constraints $2y - x \leq 8$; $x - y \leq 4$; $x \geq 0$, $y \geq 0$

8. (a) Find an equation of the line through the point $(2, -9)$ and the intersection of the lines $2x + 5y - 8 = 0$ and $3x - 4y - 6 = 0$

(b) Show that the lines $3x - 2y = 0$ and $2x + 3y - 13 = 0$ are tangents to the circle $x^2 + y^2 + 6x - 4y = 0$

9.(a) Find an equation of the tangent to the parabola $y^2 = -6x$ which is parallel to the line $2x + y + 1 = 0$. Also find the point of tangency.

(b) In any triangle ABC , prove that $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

INTERMEDIATE PART-II (12th 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) Define the term odd and even function.
- (ii) Prove the identity $\cosh^2 x - \sinh^2 x = 1$
- (iii) Evaluate $\lim_{x \rightarrow 3} \frac{x-3}{\sqrt{x}-\sqrt{3}}$
- (iv) Find the domain and the range of function $g(x) = \sqrt{x+1}$
- (v) Given that $f(x) = x^3 - 2x^2 + 4x - 1$
- (vi) Find the derivative of $\frac{1}{\sqrt{x+a}}$ w.r.t. x
- (vii) Find $\frac{dy}{dx}$ if $y^2 - xy - x^2 + 4 = 0$
- (viii) Differentiate w.r.t. x $\cos \sqrt{x} + \sqrt{\sin x}$
- (ix) Find $\frac{dy}{dx}$ if $y = x \cos y$
- (x) Differentiate $y = e^{f(x)}$ w.r.t. x
- (xi) Write Maclaurin Series Expansion.
- (xii) Find y_4 if $y = \sin 3x$

3. Attempt any eight parts.

8 × 2 = 16

- (i) Use differentials to approximate the values of $\sqrt[4]{17}$
- (ii) Evaluate $\int \sin^2 x \, dx$
- (iii) Evaluate $\int \frac{dx}{x(\ln 2x)^3}$ ($x > 0$)
- (iv) Evaluate $\int \sin^{-1} x \, dx$
- (v) Evaluate $\int e^{2x} [-\sin x + 2 \cos x] \, dx$
- (vi) Evaluate $\int_0^{\frac{\pi}{4}} \sec x (\sec x + \tan x) \, dx$
- (vii) Find the area between the x -axis and the curve $y = \cos \frac{1}{2}x$ from $x = -\pi$ to $x = \pi$.
- (viii) Solve the differential equation $\frac{dy}{dx} = \frac{y}{x^2}$
- (ix) Find the point three-fifth of the way along the line segment from $A(-5, 8)$ to $B(5, 3)$.
- (x) Find k , so that the line joining $A(7, 3)$; $B(k, -6)$ and the line joining $C(-4, 5)$ and $D(-6, 4)$ are perpendicular.
- (xi) Find the point of intersection of the lines $3x + y + 12 = 0$ and $x + 2y - 1 = 0$
- (xii) Find the lines represented by $3x^2 + 7xy + 2y^2 = 0$

P.T.O.

(2)

103

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

- (i) Graph the solution set of inequality $x + 2y < 6$
- (ii) What is feasible region?
- (iii) Write an equation of circle with centre $(-3, 5)$ and radius 7.
- (iv) Write down equation of normal to circle $x^2 + y^2 = 25$ at $(4, 3)$.
- (v) Describe the term Latusrectum of the parabola.
- (vi) Find the foci and eccentricity of the ellipse $x^2 + 4y^2 = 16$.
- (vii) Determine the vertices and centre of $\frac{y^2}{16} - \frac{x^2}{9} = 1$
- (viii) Find an equation of the tangent line to $y^2 = 4ax$ at $(at^2, 2at)$
- (ix) If $\underline{y} = 2\underline{i} + 6\underline{j}$, then find unit vector in the direction of $\underline{y}$.
- (x) Determine a vector whose magnitude is 4 and is parallel to $2\underline{i} - 3\underline{j} + 6\underline{k}$
- (xi) Prove that in any triangle ABC , $b^2 = c^2 + a^2 - 2ca \cos B$
- (xii) Find a vector perpendicular to each of the vectors $\underline{a} = 2\underline{i} + \underline{j} + \underline{k}$ and $\underline{b} = 4\underline{i} + 2\underline{j} - \underline{k}$
- (xiii) Show 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) If $f(x) = \begin{cases} 2x + 5 & \text{if } x \leq 2 \\ 4x + 1 & \text{if } x > 2 \end{cases}$ discuss continuity of $f(x)$ at $x = 2$
- (b) If $x = \sin \theta$; $y = \sin m\theta$, show that $(1 - x^2)y_2 - xy_1 + m^2y = 0$

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) Find the distance between the parallel lines $2x + y + 2 = 0$ and $6x + 3y - 8 = 0$

7. (a) Find the general solution of the equation $\frac{dy}{dx} - x = xy^2$. Also find the particular solution if $y = 1$ when $x = 0$

- (b) Minimize $z = 2x + y$ subject to the constraints $x + y \geq 3$, $7x + 5y \leq 35$, $x \geq 0$, $y \geq 0$

8. (a) Find the condition that the lines $y = m_1x + c_1$, $y = m_2x + c_2$ and $y = m_3x + c_3$ are concurrent.

- (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) Show that mid point of the hypotenuse of a right angle triangle is equidistant from its vertices.

- (b) Prove that latusrectum of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is $\frac{2b^2}{a^2}$

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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) $\lim_{x \rightarrow 0} \left(1 + \frac{x}{2}\right)^{\frac{1}{x}} = ?$ (A) e (B) $\frac{1}{e}$ (C) $\sqrt{e}$ (D) $e^{\sqrt{x}}$
- (2) If $f(x) = \frac{1}{x}$, $f(x)$ is discontinuous at:
(A) $x = 0$ (B) $x = 1$ (C) $x = -1$ (D) $x = -2$
- (3) If $f(x) = \cos x$, then $f'\left(\frac{\pi}{2}\right) = ?$ (A) 0 (B) -1 (C) 1 (D) $\frac{1}{2}$
- (4) If $f'(x) < 0$ then $f(x)$:
(A) Increases (B) Decreases (C) Constant (D) Exponential
- (5) $\frac{d}{dx}(\cos 2\pi) = ?$ (A) 1 (B) -1 (C) 2 (D) 0
- (6) $\frac{d}{dx}(\sec^{-1}x) = ?$ (A) $\frac{1}{\sqrt{1-x^2}}$ (B) $\frac{1}{x\sqrt{x^2-1}}$ (C) $\frac{-1}{x\sqrt{1-x^2}}$ (D) $\frac{1}{x\sqrt{1-x^2}}$
- (7) $2 \int_a^b x \, dx = ?$ (A) $b^2 - a^2$ (B) $a^2 - b^2$ (C) $a - b$ (D) $b - a$
- (8) $2 \int \sin 2x \, dx = ?$ (A) $\frac{\cos 2x}{2} + c$ (B) $\frac{\sin 2x}{2} + c$ (C) $\frac{-\sin 2x}{2}$ (D) $-\cos 2x + c$
- (9) Solution of $\frac{dy}{dx} = \sec^2 x$ is: (A) $y = \tan x$ (B) $y = \sec x$ (C) $y = \cos x$ (D) $y = \sin x$
- (10) $\int_0^{\pi} \sin x \, dx = ?$ (A) 0 (B) 2 (C) -2 (D) 4
- (11) Distance of a point (0, 0) from $x + y = 1$ is: (A) 0 (B) 1 (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$
- (12) Lines represented by $ax^2 + 2hxy + by^2 = 0$ will be parallel:
(A) $a + b = 0$ (B) $h^2 + ab = 0$ (C) $h^2 - ab = 0$ (D) $a - b = 0$
- (13) Inclination of a line $y = \sqrt{3}x + 1$ is: (A) 30° (B) 60° (C) 45° (D) 135°
- (14) The line $y = x + 1$ passing through the point: (A) (0, 1) (B) (1, 0) (C) (1, 1) (D) (-1, -1)
- (15) Inequality $x + 2y < 6$ is satisfied by: (A) (4, 1) (B) (1, 3) (C) (3, 1) (D) (1, 4)
- (16) Diameter of a circle $x^2 + y^2 = 9$ is: (A) 3 (B) 4 (C) 5 (D) 6
- (17) Directrix of a parabola $x^2 = -16y$ is: (A) $y = -4$ (B) $y = 4$ (C) $x = 4$ (D) $x = -4$
- (18) Centre of a circle $(x-1)^2 + (y+1)^2 = 25$ is: (A) (1, 1) (B) (1, 0) (C) (1, -1) (D) (0, 0)
- (19) $\hat{j} \times \hat{i} = ?$ (A) $\hat{k}$ (B) $\hat{i}$ (C) $\vec{0}$ (D) $-\hat{k}$
- (20) $\hat{i} \cdot 2\hat{j} \times \hat{k} = ?$ (A) 2 (B) 0 (C) -2 (D) 3

MATHEMATICS PAPER-II
GROUP-II

TIME ALLOWED: 30 Minutes

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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) $2 \int \sin 2x \, dx = ?$ (A) $\frac{\cos 2x}{2} + c$ (B) $\frac{\sin 2x}{2} + c$ (C) $\frac{-\sin 2x}{2}$ (D) $-\cos 2x + c$
- (2) Solution of $\frac{dy}{dx} = \sec^2 x$ is: (A) $y = \tan x$ (B) $y = \sec x$ (C) $y = \cos x$ (D) $y = \sin x$
- (3) $\int_0^{\pi} \sin x \, dx = ?$ (A) 0 (B) 2 (C) -2 (D) 4
- (4) Distance of a point (0, 0) from $x + y = 1$ is: (A) 0 (B) 1 (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$
- (5) Lines represented by $ax^2 + 2hxy + by^2 = 0$ will be parallel:
 (A) $a + b = 0$ (B) $h^2 + ab = 0$ (C) $h^2 - ab = 0$ (D) $a - b = 0$
- (6) Inclination of a line $y = \sqrt{3}x + 1$ is: (A) 30° (B) 60° (C) 45° (D) 135°
- (7) The line $y = x + 1$ passing through the point: (A) (0, 1) (B) (1, 0) (C) (1, 1) (D) (-1, -1)
- (8) Inequality $x + 2y < 6$ is satisfied by: (A) (4, 1) (B) (1, 3) (C) (3, 1) (D) (1, 4)
- (9) Diameter of a circle $x^2 + y^2 = 9$ is: (A) 3 (B) 4 (C) 5 (D) 6
- (10) Directrix of a parabola $x^2 = -16y$ is: (A) $y = -4$ (B) $y = 4$ (C) $x = 4$ (D) $x = -4$
- (11) Centre of a circle $(x - 1)^2 + (y + 1)^2 = 25$ is: (A) (1, 1) (B) (1, 0) (C) (1, -1) (D) (0, 0)
- (12) $\hat{j} \times \hat{i} = ?$ (A) $\hat{k}$ (B) $\hat{i}$ (C) $\vec{0}$ (D) $-\hat{k}$
- (13) $\hat{i} \cdot 2\hat{j} \times \hat{k} = ?$ (A) 2 (B) 0 (C) -2 (D) 3
- (14) $\lim_{x \rightarrow 0} \left(1 + \frac{x}{2}\right)^{\frac{1}{x}} = ?$ (A) e (B) $\frac{1}{e}$ (C) $\sqrt{e}$ (D) $e^{\sqrt{x}}$
- (15) If $f(x) = \frac{1}{x}$, $f(x)$ is discontinuous at:
 (A) $x = 0$ (B) $x = 1$ (C) $x = -1$ (D) $x = -2$
- (16) If $f(x) = \cos x$, then $f'\left(\frac{\pi}{2}\right) = ?$ (A) 0 (B) -1 (C) 1 (D) $\frac{1}{2}$
- (17) If $f'(x) < 0$ then $f(x)$:
 (A) Increases (B) Decreases (C) Constant (D) Exponential
- (18) $\frac{d}{dx}(\cos 2\pi) = ?$ (A) 1 (B) -1 (C) 2 (D) 0
- (19) $\frac{d}{dx}(\sec^{-1} x) = ?$ (A) $\frac{1}{\sqrt{1-x^2}}$ (B) $\frac{1}{x\sqrt{x^2-1}}$ (C) $\frac{-1}{x\sqrt{1-x^2}}$ (D) $\frac{1}{x\sqrt{1-x^2}}$
- (20) $2 \int_a^b x \, dx = ?$ (A) $b^2 - a^2$ (B) $a^2 - b^2$ (C) $a - b$ (D) $b - a$

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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) $\frac{d}{dx}(\cos 2\pi) = ?$ (A) 1 (B) -1 (C) 2 (D) 0
- (2) $\frac{d}{dx}(\sec h^{-1}x) = ?$ (A) $\frac{1}{\sqrt{1-x^2}}$ (B) $\frac{1}{x\sqrt{x^2-1}}$ (C) $\frac{-1}{x\sqrt{1-x^2}}$ (D) $\frac{1}{x\sqrt{1-x^2}}$
- (3) $2\int_a^b x dx = ?$ (A) $b^2 - a^2$ (B) $a^2 - b^2$ (C) $a - b$ (D) $b - a$
- (4) $2\int \sin 2x dx = ?$ (A) $\frac{\cos 2x}{2} + c$ (B) $\frac{\sin 2x}{2} + c$ (C) $\frac{-\sin 2x}{2}$ (D) $-\cos 2x + c$
- (5) Solution of $\frac{dy}{dx} = \sec^2 x$ is: (A) $y = \tan x$ (B) $y = \sec x$ (C) $y = \cos x$ (D) $y = \sin x$
- (6) $\int_0^\pi \sin x dx = ?$ (A) 0 (B) 2 (C) -2 (D) 4
- (7) Distance of a point (0, 0) from $x + y = 1$ is: (A) 0 (B) 1 (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$
- (8) Lines represented by $ax^2 + 2hxy + by^2 = 0$ will be parallel:
(A) $a + b = 0$ (B) $h^2 + ab = 0$ (C) $h^2 - ab = 0$ (D) $a - b = 0$
- (9) Inclination of a line $y = \sqrt{3}x + 1$ is: (A) 30° (B) 60° (C) 45° (D) 135°
- (10) The line $y = x + 1$ passing through the point: (A) (0, 1) (B) (1, 0) (C) (1, 1) (D) (-1, -1)
- (11) Inequality $x + 2y < 6$ is satisfied by: (A) (4, 1) (B) (1, 3) (C) (3, 1) (D) (1, 4)
- (12) Diameter of a circle $x^2 + y^2 = 9$ is: (A) 3 (B) 4 (C) 5 (D) 6
- (13) Directrix of a parabola $x^2 = -16y$ is: (A) $y = -4$ (B) $y = 4$ (C) $x = 4$ (D) $x = -4$
- (14) Centre of a circle $(x-1)^2 + (y+1)^2 = 25$ is: (A) (1, 1) (B) (1, 0) (C) (1, -1) (D) (0, 0)
- (15) $\hat{j} \times \hat{i} = ?$ (A) $\hat{k}$ (B) $\hat{i}$ (C) $\vec{O}$ (D) $-\hat{k}$
- (16) $\hat{i} \cdot 2\hat{j} \times \hat{k} = ?$ (A) 2 (B) 0 (C) -2 (D) 3
- (17) $\lim_{x \rightarrow 0} \left(1 + \frac{x}{2}\right)^{\frac{1}{x}} = ?$ (A) e (B) $\frac{1}{e}$ (C) $\sqrt{e}$ (D) $e^{\sqrt{x}}$
- (18) If $f(x) = \frac{1}{x}$, $f(x)$ is discontinuous at:
(A) $x = 0$ (B) $x = 1$ (C) $x = -1$ (D) $x = -2$
- (19) If $f(x) = \cos x$, then $f'\left(\frac{\pi}{2}\right) = ?$ (A) 0 (B) -1 (C) 1 (D) $\frac{1}{2}$
- (20) If $f'(x) < 0$ then $f(x)$:
(A) Increases (B) Decreases (C) Constant (D) Exponential

MATHEMATICS PAPER-II
GROUP-II
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, 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. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) Diameter of a circle $x^2 + y^2 = 9$ is: (A) 3 (B) 4 (C) 5 (D) 6
- (2) Directrix of a parabola $x^2 = -16y$ is: (A) $y = -4$ (B) $y = 4$ (C) $x = 4$ (D) $x = -4$
- (3) Centre of a circle $(x-1)^2 + (y+1)^2 = 25$ is: (A) (1, 1) (B) (1, 0) (C) (1, -1) (D) (0, 0)
- (4) $\hat{j} \times \hat{i} = ?$ (A) $\hat{k}$ (B) $\hat{i}$ (C) $\vec{0}$ (D) $-\hat{k}$
- (5) $\hat{i} \cdot 2\hat{j} \times \hat{k} = ?$ (A) 2 (B) 0 (C) -2 (D) 3
- (6) $\lim_{x \rightarrow 0} \left(1 + \frac{x}{2}\right)^{\frac{1}{x}} = ?$ (A) e (B) $\frac{1}{e}$ (C) $\sqrt{e}$ (D) $e^{\sqrt{x}}$
- (7) If $f(x) = \frac{1}{x}$, $f(x)$ is discontinuous at:
 (A) $x = 0$ (B) $x = 1$ (C) $x = -1$ (D) $x = -2$
- (8) If $f(x) = \cos x$, then $f'\left(\frac{\pi}{2}\right) = ?$ (A) 0 (B) -1 (C) 1 (D) $\frac{1}{2}$
- (9) If $f'(x) < 0$ then $f(x)$:
 (A) Increases (B) Decreases (C) Constant (D) Exponential
- (10) $\frac{d}{dx}(\cos 2\pi) = ?$ (A) 1 (B) -1 (C) 2 (D) 0
- (11) $\frac{d}{dx}(\sec^{-1} x) = ?$ (A) $\frac{1}{\sqrt{1-x^2}}$ (B) $\frac{1}{x\sqrt{x^2-1}}$ (C) $\frac{-1}{x\sqrt{1-x^2}}$ (D) $\frac{1}{x\sqrt{1-x^2}}$
- (12) $2 \int_a^b x \, dx = ?$ (A) $b^2 - a^2$ (B) $a^2 - b^2$ (C) $a - b$ (D) $b - a$
- (13) $2 \int \sin 2x \, dx = ?$ (A) $\frac{\cos 2x}{2} + c$ (B) $\frac{\sin 2x}{2} + c$ (C) $\frac{-\sin 2x}{2}$ (D) $-\cos 2x + c$
- (14) Solution of $\frac{dy}{dx} = \sec^2 x$ is: (A) $y = \tan x$ (B) $y = \sec x$ (C) $y = \cos x$ (D) $y = \sin x$
- (15) $\int_0^{\pi} \sin x \, dx = ?$ (A) 0 (B) 2 (C) -2 (D) 4
- (16) Distance of a point (0, 0) from $x + y = 1$ is: (A) 0 (B) 1 (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$
- (17) Lines represented by $ax^2 + 2hxy + by^2 = 0$ will be parallel:
 (A) $a + b = 0$ (B) $h^2 + ab = 0$ (C) $h^2 - ab = 0$ (D) $a - b = 0$
- (18) Inclination of a line $y = \sqrt{3}x + 1$ is: (A) 30° (B) 60° (C) 45° (D) 135°
- (19) The line $y = x + 1$ passing through the point: (A) (0, 1) (B) (1, 0) (C) (1, 1) (D) (-1, -1)
- (20) Inequality $x + 2y < 6$ is satisfied by: (A) (4, 1) (B) (1, 3) (C) (3, 1) (D) (1, 4)