BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN

OBJECTIVE KEY FOR INTER (PART-I / II) Annual Examination, 2016

Name of Subject Mathematics Session 2016 (A)

Group: 1st

Q. Nos.	Paper Code 8191	Paper Code 8193	Paper Code 8195	Paper Code 8197
1.	C	C	A	A
2.	A	B	A	F.C
3.	A	B	A	A
4.	C	B	B	C
5.	B	A	B	A
6.	C	A	A	C
7.	B	A	F.C	A
8.	B	A	A	A
9.	B	B	C	C
10.	A	B	A	B
11.	A	A	C	C
12.	A	F.C	A	B
13.	A	A	A	B
14.	B	C	C	B
15.	B	A	B	A
16.	A	C	C	A
17.	F.C	A	B	A
18.	A	A	B	A
19.	C	C	B	B
20.	A	B	A	B

Group: 2nd

Q. Nos.	Paper Code 8192	Paper Code 8194	Paper Code 8196	Paper Code 8198
1.	B	C	B	A
2.	A	C	A	D
3.	A	B	A	A
4.	B	C	B	C
5.	B	B	A	A
6.	A	B	C	B
7.	D	A	C	A
8.	A	A	B	A
9.	C	B	C	B
10.	A	B	B	A
11.	B	A	B	C
12.	A	D	A	C
13.	A	A	A	B
14.	B	C	B	C
15.	A	A	B	B
16.	C	B	A	B
17.	C	A	D	A
18.	B	A	A	A
19.	C	B	C	B
20.	B	A	A	B

سرٹیفکیٹ بابت تصحیح سوالیہ پرچہ/مارکنگ Key

ہم نے مضمون ریاضی پرچہ II گروپ ایلا تکیم انٹر سالانہ امتحان 2016ء کا سوالیہ پرچہ انشائیہ / معروضی (Subjective & Objevtive) کو بنظر عمیق چیک کرلیا ہے یہ پرچہ سلیبس 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 کرلیا ہے یہ Version آپس میں مطابقت رکھتے ہیں اور سلیبس (Syllabus) کے مطابق بھی ہیں۔ نیز اس پرچہ کی Key کی بابت بھی تصدیق کی جاتی ہے کہ یہ بھی درست بنائی گئی ہے۔ اس میں بھی کسی قسم کی کوئی غلطی نہ ہے۔

مزید یہ کہ ہم نے Key بنانے سے متعلق دفتر کی جانب سے تیارہ کردہ ہدایات وصول کر کے ان کا بغور مطالعہ کرلیا ہے اور ان کی روشنی میں Key بنائی ہے۔

PREPARED & CHECKED BY

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(8)	M. Riaz	M. Jaffar Baig	Asso. Prof.	Govt Girls College Chowk Rashaeed	

Paper Code Number: 8191

2016 (A) Roll No: _____

INTERMEDIATE PART-II (12th 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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) If $f(x) = x^{2/3} + 6$ then $f(0) =$ (A) 1 (B) 4 (C) 6 (D) 8

(2) $\lim_{x \to 0} \frac{Sin\ ax}{Sin\ bx} =$ (A) $\frac{a}{b}$ (B) $\frac{-b}{a}$ (C) $\frac{-a}{b}$ (D) $\frac{b}{a}$

(3) $\frac{d}{dx}(Cos\ x^2) =$ (A) $-2x\ Sin\ x^2$ (B) $2x\ Cos\ x^2$ (C) $x^2\ Cos\ x^2$ (D) $-x^2\ Cos\ x^2$

(4) $\frac{d}{dx}(Sec\ x) =$ (A) $Sec\ x$ (B) $Cosec\ x$ (C) $Sec\ x \tan x$ (D) $-Sec\ x \tan x$

(5) $\frac{d}{dx}(2^x) =$ (A) 2^x (B) $2^x\ \ell n 2$ (C) $\frac{1}{2}x$ (D) $\frac{1}{2^x \log 2}$

(6) $\frac{d}{dx}(Cosh^{-1}x) =$ (A) $\frac{1}{\sqrt{1+x^2}}$ (B) $\frac{1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{x^2-1}}$ (D) $\frac{-1}{\sqrt{x^2-1}}$

(7) $\frac{d}{dx}(Cot^{-1}x) =$ (A) $\frac{1}{1+x^2}$ (B) $\frac{-1}{1+x^2}$ (C) $\frac{1}{1-x^2}$ (D) $\frac{-1}{1-x^2}$

(8) $\int e^x \left(\frac{1}{x\sqrt{x^2-1}} + Sec^{-1}x \right) dx =$ (A) $\frac{e^x}{x\sqrt{x^2-1}}$ (B) $e^x Sec^{-1}x$ (C) $e^x Cosec^{-1}x$ (D) $e^x Cot^{-1}x$

(9) $\int Sin^3x\ Cos\ x\ dx =$ (A) $\frac{Sin^3x}{3}$ (B) $\frac{Sin^4x}{4}$ (C) $\frac{Sin^5x}{5}$ (D) $\frac{Cos^{-4}x}{-4}$

(10) $\int \frac{e^{Sec^{-1}x}}{x\sqrt{x^2-1}} dx$ is:- (A) $e^{Sec^{-1}x}$ (B) $e^{Cosec^{-1}x}$ (C) $e^{Tan^{-1}x}$ (D) $e^{Cot^{-1}x}$

(11) $\int_{-\pi}^{\pi} Sin\ x\ dx =$ (A) 0 (B) 4 (C) 8 (D) 16

(12) $\int Sin\ ax\ dx =$ (A) $\frac{-Cos\ ax}{a}$ (B) $Cos\ ax$ (C) $a\ Cosec\ ax$ (D) $a\ Sec\ ax$

(13) Equation of vertical line through $(5, -3)$ is:- (A) $x = 5$ (B) $y = -3$ (C) $y = 5$ (D) $x = -3$

(14) $\frac{x}{a} + \frac{y}{b} = 1$ is:-

(A) Slope intercept form (B) Two intercept form (C) Symmetric form (D) Normal form

(15) Slope of line perpendicular to $3x - 4y + 5 = 0$ is:- (A) $\frac{-3}{4}$ (B) $\frac{-4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{4}{3}$

(16) Solution of $x < \frac{-3}{2}$ is:- (A) $\left(-\infty, \frac{-3}{2}\right)$ (B) $\left(\frac{-3}{2}, \infty\right)$ (C) $\left(\frac{-3}{2}, \frac{3}{2}\right)$ (D) $(-\infty, \infty)$

(17) Standard equation of circle of radius r is:-

(A) $x^2 - y^2 = r^2$ (B) $x^2 + y^2 = r^2$ (C) $y^2 - x^2 = r^2$ (D) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

(18) Focus of $y^2 = 4ax$ is:- (A) $(a, 0)$ (B) $(-a, 0)$ (C) $(0, a)$ (D) $(0, -a)$

(19) Magnitude of $2\underline{i} - 3\underline{j} + \underline{k}$ is:- (A) $\sqrt{16}$ (B) $\sqrt{15}$ (C) $\sqrt{14}$ (D) $\sqrt{13}$

(20) Projection of $\underline{a}$ along $\underline{b}$ is:- (A) $\underline{a} . \hat{b}$ (B) $\hat{a} . \underline{b}$ (C) $\hat{a} . \hat{b}$ (C) $\underline{a} . \underline{b}$

Paper Code Number: 8192

2016 (A) Roll No: _____

INTERMEDIATE PART-II (12th 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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) Domain of $f(x)=\sqrt{x+1}$ is:- (A) $(-\infty,\infty)$ (B) $[-1,\infty)$ (C) $[0,\infty)$ (D) $[-1,1]$

(2) $\lim\limits_{x\to 0}\dfrac{e^x-1}{x}=$ (A) 1 (B) 2 (C) 3 (D) 4

(3) If $f(x)=Sinx$ then $f'(0)=$ (A) 1 (B) 2 (C) -1 (D) -2

(4) $\dfrac{d}{dx}(Tanhx)=$ (A) $-Sech^2x$ (B) $Sech^2x$ (C) $Cosechx$ (D) $-Cosech^2x$

(5) $\dfrac{d}{dx}[\log_{10}(x+1)]=$ (A) $\dfrac{1}{x+1}$ (B) $\dfrac{1}{(x+1)\ell n10}$ (C) $\dfrac{-1}{x+1}$ (D) $\dfrac{-1}{(x+1)\ell n10}$

(6) $\dfrac{d}{dx}(Sin^3x)$ (A) $3Sin^2x\,Cosx$ (B) $2Sin^2x\,Cosx$ (C) $Secx$ (D) $Cosecx$

(7) $f(x)=3x^2$ has minimum value at:- (A) $x=3$ (B) $x=2$ (C) $x=1$ (D) $x=0$

(8) $\int\dfrac{f'(x)}{f(x)}dx$

(A) $\ell n[f(x)]$ (B) $f(x)\ell n[f(x)]$ (C) $-\ell n[f(x)]$ (D) $-f(x)\ell n[f(x)]$

(9) $\int Sec5x\tan5x\,dx=$ (A) $Sec5x$ (B) $\dfrac{Sec5x}{x}$ (C) $\dfrac{Sec5x}{5}$ (D) $\dfrac{Sec5x}{5x}$

(10) $\int(x^2+2x-1)^3(2x+2)\,dx=$

(A) $\dfrac{(x^2+2x-1)^4}{4}$ (B) $\dfrac{(x^2+2x-1)^5}{5}$ (C) $\dfrac{(x^2+2x-1)^3}{3}$ (D) $\dfrac{(x^2+2x-1)^6}{6}$

(11) $\int\dfrac{Cotx}{\ell n(Sinx)}dx$ (A) $\ell n(Sinx)$ (B) $\ell n[\ell n(Sinx)]$ (C) $\ell n(Cotx)$ (D) $\ell n(Tanx)$

(12) $\int e^{Sinx}\,Cosx\,dx$ (A) e^{Sinx} (B) e^{Cosx} (C) e^{Tanx} (D) e^{Cotx}

(13) If a line passes through $A(x_1,y_1)$ and $B(x_2,y_2)$. Then its slope is:-

(A) $\dfrac{y_2-y_1}{x_2-x_1}$ (B) $-\dfrac{y_2-y_1}{x_2-x_1}$ (C) $\dfrac{x_2-x_1}{y_2-y_1}$ (D) $-\dfrac{x_2-x_1}{y_2-y_1}$

(14) Equation of line through $(1,3)$ having slope 2 is:-

(A) $x-1=2(y-3)$ (B) $y-3=2(x-1)$ (C) $y-1=2(x-3)$ (D) $x-1=2(y-3)$

(15) Perpendicular distance from $(0,0)$ to line $5x+12y-7=0$ is:-

(A) $\dfrac{7}{13}$ (B) $\dfrac{1}{13}$ (C) $\dfrac{13}{7}$ (D) 13

(16) $x=-1$ is solution of:- (A) $x+4<0$ (B) $2x+3<0$ (C) $x+4>0$ (D) $x>0$

(17) If centre is $(0,0)$ and radius is 3. Then equation of circle is:-

(A) $x^2+y^2=3$ (B) $x^2+y^2=5$ (C) $x^2+y^2=9$ (D) $x^2+y^2=11$

(18) Equation of tangent to $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}=1$ at point $P(x_1,y_1)$ is:-

(A) $\dfrac{xx_1}{a^2}-\dfrac{yy_1}{a^2}=1$ (B) $\dfrac{xx_1}{a^2}+\dfrac{yy_1}{b^2}=1$ (C) $xx_1-yy_1=0$ (D) $xx_1+yy_1=0$

(19) Unit vector perpendicular to $\underline{a}$ and $\underline{b}$ is:-

(A) $\dfrac{\underline{a}\times\underline{b}}{|\underline{a}|.|\underline{b}|}$ (B) $\dfrac{|\underline{a}\times\underline{b}|}{|\underline{a}|.|\underline{b}|}$ (C) $\dfrac{\underline{a}\times\underline{b}}{|\underline{a}\times\underline{b}|}$ (D) $|\underline{a}\times\underline{b}|$

(20) $\underline{a}$ and $\underline{b}$ are perpendicular if:- (A) $\underline{a}\times\underline{b}=0$ (B) $\underline{a}.\underline{b}=0$ (C) $\underline{a}=\underline{b}$ (D) $\underline{a}=-\underline{b}$

Paper Code Number: 8193

2016 (A)

Roll No: _____

INTERMEDIATE PART-II (12th CLASS)

MATHEMATICS PAPER-II

GROUP-I

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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) $\frac{d}{dx}\left(Cosh^{-1}x\right)=$ (A) $\frac{1}{\sqrt{1+x^2}}$ (B) $\frac{1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{x^2-1}}$ (D) $\frac{-1}{\sqrt{x^2-1}}$

(2) $\frac{d}{dx}\left(Cot^{-1}x\right)=$ (A) $\frac{1}{1+x^2}$ (B) $\frac{-1}{1+x^2}$ (C) $\frac{1}{1-x^2}$ (D) $\frac{-1}{1-x^2}$

(3) $\int e^x\left(\frac{1}{x\sqrt{x^2-1}}+Sec^{-1}x\right)dx=$ (A) $\frac{e^x}{x\sqrt{x^2-1}}$ (B) $e^xSec^{-1}x$ (C) $e^xCosec^{-1}x$ (D) $e^xCot^{-1}x$

(4) $\int Sin^3x\ Cos\,x\,dx=$ (A) $\frac{Sin^3x}{3}$ (B) $\frac{Sin^4x}{4}$ (C) $\frac{Sin^5x}{5}$ (D) $\frac{Cos^{-4}x}{-4}$

(5) $\int\frac{e^{Sec^{-1}x}}{x\sqrt{x^2-1}}dx$ is:- (A) $e^{Sec^{-1}x}$ (B) $e^{Cosec^{-1}x}$ (C) $e^{Tan^{-1}x}$ (D) $e^{Cot^{-1}x}$

(6) $\int_{-\pi}^{\pi}Sin\,x\,dx=$ (A) 0 (B) 4 (C) 8 (D) 16

(7) $\int Sin\,ax\,dx=$ (A) $\frac{-Cos\,ax}{a}$ (B) $Cos\,ax$ (C) $a\,Cosec\,ax$ (D) $a\,Sec\,ax$

(8) Equation of vertical line through $(5,-3)$ is:- (A) $x=5$ (B) $y=-3$ (C) $y=5$ (D) $x=-3$

(9) $\frac{x}{a}+\frac{y}{b}=1$ is:-

(A) Slope intercept form (B) Two intercept form (C) Symmetric form (D) Normal form

(10) Slope of line perpendicular to $3x-4y+5=0$ is:- (A) $\frac{-3}{4}$ (B) $\frac{-4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{4}{3}$

(11) Solution of $x<\frac{-3}{2}$ is:- (A) $\left(-\infty,\frac{-3}{2}\right)$ (B) $\left(\frac{-3}{2},\infty\right)$ (C) $\left(\frac{-3}{2},\frac{3}{2}\right)$ (D) $(-\infty,\infty)$

(12) Standard equation of circle of radius r is:-

(A) $x^2-y^2=r^2$ (B) $x^2+y^2=r^2$ (C) $y^2-x^2=r^2$ (D) $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

(13) Focus of $y^2=4ax$ is:- (A) $(a,0)$ (B) $(-a,0)$ (C) $(0,a)$ (D) $(0,-a)$

(14) Magnitude of $2\underline{i}-3\underline{j}+\underline{k}$ is:- (A) $\sqrt{16}$ (B) $\sqrt{15}$ (C) $\sqrt{14}$ (D) $\sqrt{13}$

(15) Projection of $\underline{a}$ along $\underline{b}$ is:- (A) $\underline{a}.\hat{b}$ (B) $\hat{a}.\underline{b}$ (C) $\hat{a}.\hat{b}$ (C) $\underline{a}.\underline{b}$

(16) If $f(x)=x^{2/3}+6$ then $f(0)=$ (A) 1 (B) 4 (C) 6 (D) 8

(17) $\lim_{x\to 0}\frac{Sin\,ax}{Sin\,bx}=$ (A) $\frac{a}{b}$ (B) $\frac{-b}{a}$ (C) $\frac{-a}{b}$ (D) $\frac{b}{a}$

(18) $\frac{d}{dx}\left(Cos\,x^2\right)=$ (A) $-2xSin\,x^2$ (B) $2xCos\,x^2$ (C) $x^2Cos\,x^2$ (D) $-x^2Cos\,x^2$

(19) $\frac{d}{dx}\left(Sec\,x\right)=$ (A) $Sec\,x$ (B) $Cosec\,x$ (C) $Sec\,x\tan x$ (D) $-Sec\,x\tan x$

(20) $\frac{d}{dx}\left(2^x\right)=$ (A) 2^x (B) $2^x\ell n2$ (C) $\frac{1}{2}x$ (D) $\frac{1}{2^x\log 2}$

Paper Code
Number: 8194

2016 (A) Roll No: _____

INTERMEDIATE PART-II (12th 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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) $x = -1$ is solution of:- (A) $x + 4 < 0$ (B) $2x + 3 < 0$ (C) $x + 4 > 0$ (D) $x > 0$

(2) If centre is $(0, 0)$ and radius is 3. Then equation of circle is:-
(A) $x^2 + y^2 = 3$ (B) $x^2 + y^2 = 5$ (C) $x^2 + y^2 = 9$ (D) $x^2 + y^2 = 11$

(3) Equation of tangent to $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ at point $P(x_1, y_1)$ is:-
(A) $\frac{xx_1}{a^2} - \frac{yy_1}{a^2} = 1$ (B) $\frac{xx_1}{a^2} + \frac{yy_1}{b^2} = 1$ (C) $xx_1 - yy_1 = 0$ (D) $xx_1 + yy_1 = 0$

(4) Unit vector perpendicular to $\underline{a}$ and $\underline{b}$ is:-
(A) $\frac{\underline{a} \times \underline{b}}{|\underline{a}| . |\underline{b}|}$ (B) $\frac{|\underline{a} \times \underline{b}|}{|\underline{a}| . |\underline{b}|}$ (C) $\frac{\underline{a} \times \underline{b}}{|\underline{a} \times \underline{b}|}$ (D) $|\underline{a} \times \underline{b}|$

(5) $\underline{a}$ and $\underline{b}$ are perpendicular if:- (A) $\underline{a} \times \underline{b} = 0$ (B) $\underline{a} . \underline{b} = 0$ (C) $\underline{a} = \underline{b}$ (D) $\underline{a} = -\underline{b}$

(6) Domain of $f(x) = \sqrt{x+1}$ is:- (A) $(-\infty, \infty)$ (B) $[-1, \infty)$ (C) $[0, \infty)$ (D) $[-1, 1]$

(7) $\lim_{x \to 0} \frac{e^x - 1}{x} =$ (A) 1 (B) 2 (C) 3 (D) 4

(8) If $f(x) = Sin x$ then $f'(0) =$ (A) 1 (B) 2 (C) -1 (D) -2

(9) $\frac{d}{dx}(Tanh x) =$ (A) $-Sech^2 x$ (B) $Sech^2 x$ (C) $Cosech x$ (D) $-Cosech^2 x$

(10) $\frac{d}{dx}[\log_{10}(x+1)] =$ (A) $\frac{1}{x+1}$ (B) $\frac{1}{(x+1)\ell n 10}$ (C) $\frac{-1}{x+1}$ (D) $\frac{-1}{(x+1)\ell n 10}$

(11) $\frac{d}{dx}(Sin^3 x)$ (A) $3Sin^2 x Cos x$ (B) $2Sin^2 x Cos x$ (C) $Sec x$ (D) $Cosec x$

(12) $f(x) = 3x^2$ has minimum value at:- (A) $x = 3$ (B) $x = 2$ (C) $x = 1$ (D) $x = 0$

(13) $\int \frac{f'(x)}{f(x)} dx$
(A) $\ell n[f(x)]$ (B) $f(x)\ell n[f(x)]$ (C) $-\ell n[f(x)]$ (D) $-f(x)\ell n[f(x)]$

(14) $\int Sec 5x \tan 5x \, dx =$ (A) $Sec 5x$ (B) $\frac{Sec 5x}{x}$ (C) $\frac{Sec 5x}{5}$ (D) $\frac{Sec 5x}{5x}$

(15) $\int (x^2 + 2x - 1)^3 (2x + 2) dx =$
(A) $\frac{(x^2 + 2x - 1)^4}{4}$ (B) $\frac{(x^2 + 2x - 1)^5}{5}$ (C) $\frac{(x^2 + 2x - 1)^3}{3}$ (D) $\frac{(x^2 + 2x - 1)^6}{6}$

(16) $\int \frac{Cot x}{\ell n (Sin x)} dx$ (A) $\ell n (Sin x)$ (B) $\ell n [\ell n (Sin x)]$ (C) $\ell n (Cot x)$ (D) $\ell n (Tan x)$

(17) $\int e^{Sin x} Cos x \, dx$ (A) $e^{Sin x}$ (B) $e^{Cos x}$ (C) $e^{Tan x}$ (D) $e^{Cot x}$

(18) If a line passes through $A(x_1, y_1)$ and $B(x_2, y_2)$. Then its slope is:-
(A) $\frac{y_2 - y_1}{x_2 - x_1}$ (B) $-\frac{y_2 - y_1}{x_2 - x_1}$ (C) $\frac{x_2 - x_1}{y_2 - y_1}$ (D) $-\frac{x_2 - x_1}{y_2 - y_1}$

(19) Equation of line through $(1, 3)$ having slope 2 is:-
(A) $x - 1 = 2(y - 3)$ (B) $y - 3 = 2(x - 1)$ (C) $y - 1 = 2(x - 3)$ (D) $x - 1 = 2(y - 3)$

(20) Perpendicular distance from $(0, 0)$ to line $5x + 12y - 7 = 0$ is:-
(A) $\frac{7}{13}$ (B) $\frac{1}{13}$ (C) $\frac{13}{7}$ (D) 13

Paper Code Number: 8195

2016 (A) Roll No: _____

INTERMEDIATE PART-II (12th CLASS)

MATHEMATICS PAPER-II

GROUP-I

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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) $\int_{-\pi}^{\pi} Sin\,x\,dx =$ (A) 0 (B) 4 (C) 8 (D) 16

(2) $\int Sin\,ax\,dx =$ (A) $\frac{-Cos\,ax}{a}$ (B) $Cos\,ax$ (C) $a\,Cosec\,ax$ (D) $a\,Sec\,ax$

(3) Equation of vertical line through $(5,-3)$ is:- (A) $x=5$ (B) $y=-3$ (C) $y=5$ (D) $x=-3$

(4) $\frac{x}{a}+\frac{y}{b}=1$ is:-

(A) Slope intercept form (B) Two intercept form (C) Symmetric form (D) Normal form

(5) Slope of line perpendicular to $3x-4y+5=0$ is:- (A) $\frac{-3}{4}$ (B) $\frac{-4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{4}{3}$

(6) Solution of $x<\frac{-3}{2}$ is:- (A) $\left(-\infty,\frac{-3}{2}\right)$ (B) $\left(\frac{-3}{2},\infty\right)$ (C) $\left(\frac{-3}{2},\frac{3}{2}\right)$ (D) $(-\infty,\infty)$

(7) Standard equation of circle of radius r is:-

(A) $x^2-y^2=r^2$ (B) $x^2+y^2=r^2$ (C) $y^2-x^2=r^2$ (D) $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

(8) Focus of $y^2=4ax$ is:- (A) $(a,0)$ (B) $(-a,0)$ (C) $(0,a)$ (D) $(0,-a)$

(9) Magnitude of $2\underline{i}-3\underline{j}+\underline{k}$ is:- (A) $\sqrt{16}$ (B) $\sqrt{15}$ (C) $\sqrt{14}$ (D) $\sqrt{13}$

(10) Projection of $\underline{a}$ along $\underline{b}$ is:- (A) $\underline{a}.\hat{b}$ (B) $\hat{a}.\underline{b}$ (C) $\hat{a}.\hat{b}$ (C) $\underline{a}.\underline{b}$

(11) If $f(x)=x^{2/3}+6$ then $f(0)=$ (A) 1 (B) 4 (C) 6 (D) 8

(12) $\lim_{x\to 0}\frac{Sin\,ax}{Sin\,bx}=$ (A) $\frac{a}{b}$ (B) $\frac{-b}{a}$ (C) $\frac{-a}{b}$ (D) $\frac{b}{a}$

(13) $\frac{d}{dx}(Cos\,x^2)=$ (A) $-2x\,Sin\,x^2$ (B) $2x\,Cos\,x^2$ (C) $x^2\,Cos\,x^2$ (D) $-x^2\,Cos\,x^2$

(14) $\frac{d}{dx}(Sec\,x)=$ (A) $Sec\,x$ (B) $Cosec\,x$ (C) $Sec\,x\tan x$ (D) $-Sec\,x\tan x$

(15) $\frac{d}{dx}(2^x)=$ (A) 2^x (B) $2^x\ell n2$ (C) $\frac{1}{2}x$ (D) $\frac{1}{2^x\log 2}$

(16) $\frac{d}{dx}(Cosh^{-1}x)=$ (A) $\frac{1}{\sqrt{1+x^2}}$ (B) $\frac{1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{x^2-1}}$ (D) $\frac{-1}{\sqrt{x^2-1}}$

(17) $\frac{d}{dx}(Cot^{-1}x)=$ (A) $\frac{1}{1+x^2}$ (B) $\frac{-1}{1+x^2}$ (C) $\frac{1}{1-x^2}$ (D) $\frac{-1}{1-x^2}$

(18) $\int e^x\left(\frac{1}{x\sqrt{x^2-1}}+Sec^{-1}x\right)dx=$ (A) $\frac{e^x}{x\sqrt{x^2-1}}$ (B) $e^x Sec^{-1}x$ (C) $e^x Cosec^{-1}x$ (D) $e^x Cot^{-1}x$

(19) $\int Sin^3x\,Cos\,x\,dx=$ (A) $\frac{Sin^3x}{3}$ (B) $\frac{Sin^4x}{4}$ (C) $\frac{Sin^5x}{5}$ (D) $\frac{Cos^{-4}x}{-4}$

(20) $\int\frac{e^{Sec^{-1}x}}{x\sqrt{x^2-1}}dx$ is:- (A) $e^{Sec^{-1}x}$ (B) $e^{Cosec^{-1}x}$ (C) $e^{Tan^{-1}x}$ (D) $e^{Cot^{-1}x}$

Paper Code
Number: 8196

2016 (A)

Roll No: _____

INTERMEDIATE PART-II (12th 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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) $\int \frac{Cot\,x}{\ell n\,(Sin\,x)}\,dx$ (A) $\ell n\,(Sin\,x)$ (B) $\ell n\,[\ell n\,(Sin\,x)]$ (C) $\ell n(Cot\,x)$ (D) $\ell n(Tan\,x)$

(2) $\int e^{Sin\,x}\,Cos\,x\,dx$ (A) $e^{Sin\,x}$ (B) $e^{Cos\,x}$ (C) $e^{Tan\,x}$ (D) $e^{Cot\,x}$

(3) If a line passes through $A(x_1, y_1)$ and $B(x_2, y_2)$. Then its slope is:-

(A) $\frac{y_2 - y_1}{x_2 - x_1}$ (B) $-\frac{y_2 - y_1}{x_2 - x_1}$ (C) $\frac{x_2 - x_1}{y_2 - y_1}$ (D) $-\frac{x_2 - x_1}{y_2 - y_1}$

(4) Equation of line through $(1, 3)$ having slope 2 is:-

(A) $x - 1 = 2(y - 3)$ (B) $y - 3 = 2(x - 1)$ (C) $y - 1 = 2(x - 3)$ (D) $x - 1 = 2(y - 3)$

(5) Perpendicular distance from $(0, 0)$ to line $5x + 12y - 7 = 0$ is:-

(A) $\frac{7}{13}$ (B) $\frac{1}{13}$ (C) $\frac{13}{7}$ (D) 13

(6) $x = -1$ is solution of:- (A) $x + 4 < 0$ (B) $2x + 3 < 0$ (C) $x + 4 > 0$ (D) $x > 0$

(7) If centre is $(0, 0)$ and radius is 3. Then equation of circle is:-

(A) $x^2 + y^2 = 3$ (B) $x^2 + y^2 = 5$ (C) $x^2 + y^2 = 9$ (D) $x^2 + y^2 = 11$

(8) Equation of tangent to $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ at point $P(x_1, y_1)$ is:-

(A) $\frac{xx_1}{a^2} - \frac{yy_1}{a^2} = 1$ (B) $\frac{xx_1}{a^2} + \frac{yy_1}{b^2} = 1$ (C) $xx_1 - yy_1 = 0$ (D) $xx_1 + yy_1 = 0$

(9) Unit vector perpendicular to $\underline{a}$ and $\underline{b}$ is:-

(A) $\frac{\underline{a} \times \underline{b}}{|\underline{a}| \cdot |\underline{b}|}$ (B) $\frac{|\underline{a} \times \underline{b}|}{|\underline{a}| \cdot |\underline{b}|}$ (C) $\frac{\underline{a} \times \underline{b}}{|\underline{a} \times \underline{b}|}$ (D) $|\underline{a} \times \underline{b}|$

(10) $\underline{a}$ and $\underline{b}$ are perpendicular if:- (A) $\underline{a} \times \underline{b} = 0$ (B) $\underline{a} \cdot \underline{b} = 0$ (C) $\underline{a} = \underline{b}$ (D) $\underline{a} = -\underline{b}$

(11) Domain of $f(x) = \sqrt{x+1}$ is:- (A) $(-\infty, \infty)$ (B) $[-1, \infty)$ (C) $[0, \infty)$ (D) $[-1, 1]$

(12) $\lim_{x \to 0} \frac{e^x - 1}{x} =$ (A) 1 (B) 2 (C) 3 (D) 4

(13) If $f(x) = Sin\,x$ then $f'(0) =$ (A) 1 (B) 2 (C) -1 (D) -2

(14) $\frac{d}{dx}(Tanh\,x) =$ (A) $-Sech^2 x$ (B) $Sech^2 x$ (C) $Cosech\,x$ (D) $-Cosech^2 x$

(15) $\frac{d}{dx}[\log_{10}(x+1)] =$ (A) $\frac{1}{x+1}$ (B) $\frac{1}{(x+1)\,\ell n10}$ (C) $\frac{-1}{x+1}$ (D) $\frac{-1}{(x+1)\,\ell n10}$

(16) $\frac{d}{dx}(Sin^3 x)$ (A) $3Sin^2 x\,Cos\,x$ (B) $2Sin^2 x\,Cos\,x$ (C) $Sec\,x$ (D) $Cosec\,x$

(17) $f(x) = 3x^2$ has minimum value at:- (A) $x = 3$ (B) $x = 2$ (C) $x = 1$ (D) $x = 0$

(18) $\int \frac{f'(x)}{f(x)}\,dx$

(A) $\ell n[f(x)]$ (B) $f(x)\,\ell n[f(x)]$ (C) $-\ell n[f(x)]$ (D) $-f(x)\,\ell n[f(x)]$

(19) $\int Sec\,5x\,\tan 5x\,dx =$ (A) $Sec\,5x$ (B) $\frac{Sec\,5x}{x}$ (C) $\frac{Sec\,5x}{5}$ (D) $\frac{Sec\,5x}{5x}$

(20) $\int (x^2 + 2x - 1)^3\,(2x + 2)\,dx =$

(A) $\frac{(x^2 + 2x - 1)^4}{4}$ (B) $\frac{(x^2 + 2x - 1)^5}{5}$ (C) $\frac{(x^2 + 2x - 1)^3}{3}$ (D) $\frac{(x^2 + 2x - 1)^6}{6}$

Paper Code Number: 8197

2016 (A) Roll No: _____

INTERMEDIATE PART-II (12th CLASS)

MATHEMATICS PAPER-II

GROUP-I

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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) Solution of $x < \frac{-3}{2}$ is:- (A) $\left(-\infty, \frac{-3}{2}\right)$ (B) $\left(\frac{-3}{2}, \infty\right)$ (C) $\left(\frac{-3}{2}, \frac{3}{2}\right)$ (D) $(-\infty, \infty)$

(2) Standard equation of circle of radius r is:-

(A) $x^2 - y^2 = r^2$ (B) $x^2 + y^2 = r^2$ (C) $y^2 - x^2 = r^2$ (D) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

(3) Focus of $y^2 = 4ax$ is:- (A) $(a, 0)$ (B) $(-a, 0)$ (C) $(0, a)$ (D) $(0, -a)$

(4) Magnitude of $2\underline{i} - 3\underline{j} + \underline{k}$ is:- (A) $\sqrt{16}$ (B) $\sqrt{15}$ (C) $\sqrt{14}$ (D) $\sqrt{13}$

(5) Projection of $\underline{a}$ along $\underline{b}$ is:- (A) $\underline{a} \cdot \hat{b}$ (B) $\hat{a} \cdot \underline{b}$ (C) $\hat{a} \cdot \hat{b}$ (C) $\underline{a} \cdot \underline{b}$

(6) If $f(x) = x^{3/3} + 6$ then $f(0) =$ (A) 1 (B) 4 (C) 6 (D) 8

(7) $\lim_{x \to 0} \frac{Sin\ ax}{Sin bx} =$ (A) $\frac{a}{b}$ (B) $\frac{-b}{a}$ (C) $\frac{-a}{b}$ (D) $\frac{b}{a}$

(8) $\frac{d}{dx}(Cos x^2) =$ (A) $-2x Sin x^2$ (B) $2x Cos x^2$ (C) $x^2 Cos x^2$ (D) $-x^2 Cos x^2$

(9) $\frac{d}{dx}(Sec x) =$ (A) $Sec x$ (B) $Cosec x$ (C) $Sec x \tan x$ (D) $-Sec x \tan x$

(10) $\frac{d}{dx}(2^x) =$ (A) 2^x (B) $2^x \ell n 2$ (C) $\frac{1}{2}x$ (D) $\frac{1}{2^x \log 2}$

(11) $\frac{d}{dx}(Cosh^{-1}x) =$ (A) $\frac{1}{\sqrt{1+x^2}}$ (B) $\frac{1}{\sqrt{1-x^2}}$ (C) $\frac{1}{\sqrt{x^2-1}}$ (D) $\frac{-1}{\sqrt{x^2-1}}$

(12) $\frac{d}{dx}(Cot^{-1}x) =$ (A) $\frac{1}{1+x^2}$ (B) $\frac{-1}{1+x^2}$ (C) $\frac{1}{1-x^2}$ (D) $\frac{-1}{1-x^2}$

(13) $\int e^x \left(\frac{1}{x\sqrt{x^2-1}} + Sec^{-1}x\right) dx =$ (A) $\frac{e^x}{x\sqrt{x^2-1}}$ (B) $e^x Sec^{-1}x$ (C) $e^x Cosec^{-1}x$ (D) $e^x Cot^{-1}x$

(14) $\int Sin^3 x\ Cos x\ dx =$ (A) $\frac{Sin^3 x}{3}$ (B) $\frac{Sin^4 x}{4}$ (C) $\frac{Sin^5 x}{5}$ (D) $\frac{Cos^{-4} x}{-4}$

(15) $\int \frac{e^{Sec^{-1}x}}{x\sqrt{x^2-1}} dx$ is:- (A) $e^{Sec^{-1}x}$ (B) $e^{Cosec^{-1}x}$ (C) $e^{Tan^{-1}x}$ (D) $e^{Cot^{-1}x}$

(16) $\int_{-\pi}^{\pi} Sin x\ dx =$ (A) 0 (B) 4 (C) 8 (D) 16

(17) $\int Sin ax\ dx =$ (A) $\frac{-Cos ax}{a}$ (B) $Cos ax$ (C) $a\ Cosec\ ax$ (D) $a Sec ax$

(18) Equation of vertical line through $(5, -3)$ is:- (A) $x = 5$ (B) $y = -3$ (C) $y = 5$ (D) $x = -3$

(19) $\frac{x}{a} + \frac{y}{b} = 1$ is:-

(A) Slope intercept form (B) Two intercept form (C) Symmetric form (D) Normal form

(20) Slope of line perpendicular to $3x - 4y + 5 = 0$ is:- (A) $\frac{-3}{4}$ (B) $\frac{-4}{3}$ (C) $\frac{3}{4}$ (D) $\frac{4}{3}$

Paper Code
Number: 8198

2016 (A) Roll No: _____

INTERMEDIATE PART-II (12th 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 circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles 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 question on this sheet of OBJECTIVE PAPER.

Q.No.1

(1) $\frac{d}{dx}(Sin^3 x)$ (A) $3Sin^2 x\,Cos\,x$ (B) $2Sin^2 x\,Cos\,x$ (C) $Sec\,x$ (D) $Cosec\,x$

(2) $f(x)=3x^2$ has minimum value at:- (A) $x=3$ (B) $x=2$ (C) $x=1$ (D) $x=0$

(3) $\int \frac{f'(x)}{f(x)}\,dx$

(A) $\ell n[f(x)]$ (B) $f(x)\,\ell n[f(x)]$ (C) $-\ell n[f(x)]$ (D) $-f(x)\,\ell n[f(x)]$

(4) $\int Sec\,5x\,\tan 5x\,dx =$ (A) $Sec\,5x$ (B) $\frac{Sec\,5x}{x}$ (C) $\frac{Sec\,5x}{5}$ (D) $\frac{Sec\,5x}{5x}$

(5) $\int (x^2+2x-1)^3\,(2x+2)\,dx =$

(A) $\frac{(x^2+2x-1)^4}{4}$ (B) $\frac{(x^2+2x-1)^5}{5}$ (C) $\frac{(x^2+2x-1)^3}{3}$ (D) $\frac{(x^2+2x-1)^6}{6}$

(6) $\int \frac{Cot\,x}{\ell n\,(Sin\,x)}\,dx$ (A) $\ell n\,(Sin\,x)$ (B) $\ell n\,[\ell n\,(Sin\,x)]$ (C) $\ell n(Cot\,x)$ (D) $\ell n(Tan\,x)$

(7) $\int e^{Sin\,x}\,Cos\,x\,dx$ (A) $e^{Sin\,x}$ (B) $e^{Cos\,x}$ (C) $e^{Tan\,x}$ (D) $e^{Cot\,x}$

(8) If a line passes through $A(x_1, y_1)$ and $B(x_2, y_2)$. Then its slope is:-

(A) $\frac{y_2-y_1}{x_2-x_1}$ (B) $-\frac{y_2-y_1}{x_2-x_1}$ (C) $\frac{x_2-x_1}{y_2-y_1}$ (D) $-\frac{x_2-x_1}{y_2-y_1}$

(9) Equation of line through $(1, 3)$ having slope 2 is:-

(A) $x-1=2(y-3)$ (B) $y-3=2(x-1)$ (C) $y-1=2(x-3)$ (D) $x-1=2(y-3)$

(10) Perpendicular distance from $(0, 0)$ to line $5x+12y-7=0$ is:-

(A) $\frac{7}{13}$ (B) $\frac{1}{13}$ (C) $\frac{13}{7}$ (D) 13

(11) $x=-1$ is solution of:- (A) $x+4<0$ (B) $2x+3<0$ (C) $x+4>0$ (D) $x>0$

(12) If centre is $(0, 0)$ and radius is 3. Then equation of circle is:-

(A) $x^2+y^2=3$ (B) $x^2+y^2=5$ (C) $x^2+y^2=9$ (D) $x^2+y^2=11$

(13) Equation of tangent to $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ at point $P(x_1, y_1)$ is:-

(A) $\frac{xx_1}{a^2}-\frac{yy_1}{a^2}=1$ (B) $\frac{xx_1}{a^2}+\frac{yy_1}{b^2}=1$ (C) $xx_1-yy_1=0$ (D) $xx_1+yy_1=0$

(14) Unit vector perpendicular to $\underline{a}$ and $\underline{b}$ is:-

(A) $\frac{\underline{a}\times\underline{b}}{|\underline{a}|.|\underline{b}|}$ (B) $\frac{|\underline{a}\times\underline{b}|}{|\underline{a}|.|\underline{b}|}$ (C) $\frac{\underline{a}\times\underline{b}}{|\underline{a}\times\underline{b}|}$ (D) $|\underline{a}\times\underline{b}|$

(15) $\underline{a}$ and $\underline{b}$ are perpendicular if:- (A) $\underline{a}\times\underline{b}=0$ (B) $\underline{a}.\underline{b}=0$ (C) $\underline{a}=\underline{b}$ (D) $\underline{a}=-\underline{b}$

(16) Domain of $f(x)=\sqrt{x+1}$ is:- (A) $(-\infty, \infty)$ (B) $[-1, \infty)$ (C) $[0, \infty)$ (D) $[-1, 1]$

(17) $\lim_{x\to 0}\frac{e^x-1}{x}=$ (A) 1 (B) 2 (C) 3 (D) 4

(18) If $f(x)=Sin\,x$ then $f'(0)=$ (A) 1 (B) 2 (C) -1 (D) -2

(19) $\frac{d}{dx}(Tanh\,x)=$ (A) $-Sech^2 x$ (B) $Sech^2 x$ (C) $Cosech\,x$ (D) $-Cosech^2 x$

(20) $\frac{d}{dx}[\log_{10}(x+1)]=$ (A) $\frac{1}{x+1}$ (B) $\frac{1}{(x+1)\,\ell n10}$ (C) $\frac{-1}{x+1}$ (D) $\frac{-1}{(x+1)\,\ell n10}$

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

(i) Find area of triangle with vertices $A(1, 4)$, $B(2, -3)$, $C(3, -10)$

(ii) Find equation of perpendicular bisector of segment joining $A(3, 5)$, $B(9, 8)$

(iii) Find h such that $A(h, 1)$, $B(2, 7)$, $C(-6, -7)$ are vertices of a right triangle with right angle at A

(iv) Check whether lines $x - 2y - 6 = 0$, $3x - y + 3 = 0$, $2x + y - 4 = 0$ are concurrent.

(v) Convert $15y - 8x + 3 = 0$ into normal form.

(vi) Find equation of a circle with centre $\left(\sqrt{2}, -3\sqrt{3}\right)$ and radius $2\sqrt{2}$

(vii) Find length of tangent from $P(-5, 10)$ to circle $5x^2 + 5y^2 + 14x + 12y - 10 = 0$

(viii) Find equation of parabola with focus $(-3, 1)$, directrix $x = 3$.

(ix) Find foci and eccentricity of ellipse $9x^2 + y^2 = 18$

(x) Find $A(x, y)$ if $\overline{AB} = \overline{CD}$ given that $B = (1, 2)$, $C = (-2, 5)$, $D = (4, 11)$

(xi) Find direction cosine of $6i - 2j + k$.

(xii) Find angle between vectors $\underline{u} = 2i - j + k$ and $\underline{v} = -i + j$

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

SECTION-II

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

5.(a) If $f(x) = \begin{cases} \dfrac{\sqrt{2x+5} - \sqrt{x+7}}{x-2} & , \quad x \neq 2 \\ k & \text{if} \quad x = 2 \end{cases}$ Find value of k, so that f is continuous at $x = 2$

(b) If $y = a\cos(\ell nx) + b\sin(\ell nx)$ prove that $x^2\dfrac{d^2y}{dx^2} + x\dfrac{dy}{dx} + y = 0$

6.(a) Evaluate $\int Tan^3 x\, Sec\, x\, dx$

(b) The vertices of a triangle are $A(-2, 3)$, $B(-4, 1)$ and $C(3, 5)$. Find coordinates of orthocentre.

7. (a) Solve the differential equation $\left(x^2 - yx^2\right)\dfrac{dy}{dx} + y^2 + xy^2 = 0$

(b) Maximize $f(x, y) = x + 3y$ subject to the constraints $2x + 5y \leq 30$, $5x + 4y \leq 20$ $x \geq 0$, $y \geq 0$

8. (a) Write an equation of circle which passes through the points $A(4, 5)$, $B(-4, -3)$, $C(8, -3)$

(b) Find the vector from the point A to the origin when $\overrightarrow{AB} = \overrightarrow{4i} - \overrightarrow{2j}$ and B is the point $(-2, 5)$

9.(a) Find equation of parabola with given elements, focus $(-3, 1)$ and directrix $x - 2y - 3 = 0$

(b) In any triangle ABC, prove that by vector method $\dfrac{a}{Sin\, A} = \dfrac{b}{Sin\, B} = \dfrac{c}{Sin\, C}$

$9 \times 2 = 18$

4. **Attempt any nine parts.**

(i) Find k so that the line joining $A(7, 3)$, $B(k, -6)$ and the line joining $C(-4, 5)$, $D(-6, 4)$ are parallel.

(ii) Find an equation of the line through $(-5, -3)$ and $(9, -1)$

(iii) Find an equation of the line through $(-4, -6)$ and perpendicular to a line having slope $\frac{-3}{2}$

(iv) Find the lines represented by the homogeneous equation $10x^2 - 23xy - 5y^2 = 0$

(v) Check whether the point $(-2, 4)$ lies above or below the line $4x + 5y - 3 = 0$

(vi) Find centre and radius of the circle $x^2 + y^2 - 6x + 4y + 13 = 0$

(vii) Determine whether the point $P(-5, 6)$ lies outside, on or inside the circle $x^2 + y^2 + 4x - 6y - 12 = 0$

(viii) Find focus and vertex of the parabola $y^2 = -12x$

(ix) Find centre and foci of ellipse $9x^2 + y^2 = 18$

(x) If $\bar{v} = 3\bar{i} - 2\bar{j} + 2\bar{k}$, $\bar{w} = 5\bar{i} - \bar{j} + 3\bar{k}$, find $|3\bar{v} + \bar{w}|$

(xi) Find cosine of angle between the vectors $u = 2\bar{i} - \bar{j} + \bar{k}$ and $\bar{v} = -\bar{i} + \bar{j}$

(xii) Find the volume of the parallelepiped determined by $\bar{u} = \bar{i} + 2\bar{j} - k$, $\bar{v} = \bar{i} - 2\bar{j} + 3k$, $\bar{w} = \bar{i} - 7j - 4\bar{k}$

(xiii) If $\bar{a} = 4\bar{i} + 3\bar{j} + \bar{k}$ and $\bar{b} = 2\bar{i} - \bar{j} + 2\bar{k}$. Find a unit vector perpendicular to both $\bar{a}$ and $\bar{b}$.

SECTION-II

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

5.(a) Evaluate $\lim_{\theta \to 0} \frac{\tan - \sin\theta}{\sin^3\theta}$

(b) If $x = \frac{1 - t^2}{1 + t^2}$, $y = \frac{2t}{1 + t^2}$ then prove that $y\frac{dy}{dx} + x = 0$

6.(a) Evaluate $\int \frac{x}{x^4 + 2x^2 + 5}\, dx$

(b) Show that distance of the point $P(x_1, y_1)$ from the line $ax + by + c = 0$ is $\frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$

7. (a) Evaluate $\int_0^{\pi/4} \frac{Cos\theta + Sin\theta}{2Cos^2\theta}\, d\theta$

(b) Minimize $f(x, y) = 3x + y$ subject to constraints $3x + 5y \geq 15$, $x + 6y \geq 9$, $x \geq 0$; $y \geq 0$

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

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

9.(a) Find the focus, vertex and directrix of the parabola $y = 6x^2 - 1$

(b) Find the moment about $A(1, 1, 1)$ of each of the concurrent forces $\underline{i} - 2\underline{j}$, $3\underline{i} + 2\underline{j} - \underline{k}$, $5\underline{j} + 2\underline{k}$ where $P(2, 0, 1)$ is their point of concurrency.

2016 (A) Roll No: _____

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.** $8 \times 2 = 16$

(i) Prove that $Sinh 2x = 2 Sinh x \, Cosh x$

(ii) Evaluate $\lim_{x \to 0} (1 + 3x)^{2/x}$

(iii) Define continuity of a function at point $x = a$

(iv) Differentiate $\frac{1}{\sqrt{x}}$ w.r.t x by definition.

(v) If $y = \frac{x^2 + 1}{x^2 - 3}$, then find $\frac{dy}{dx}$

(vi) If $x^2 + y^2 - 4x = 5$, then find $\frac{dy}{dx}$

(vii) Differentiate $Cos^{-1} x$ w.r.t x

(viii) Find $f'(x)$ when $f(x) = x^3 e^{1/x}$

(ix) If $y = Sinh^{-1}\left(\frac{x}{2}\right)$, find $\frac{dy}{dx}$

(x) Find y_2 when $y = \ell n \, (x - 9)$

(xi) Write first two terms in the Maclaurin series for the expansion of a^x.

(xii) Find critical values of $f(x) = 5 + 3x - x^3$

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

(i) Find δy and dy when $y = x^2 - 1$ and x changes from 3 to 3.02.

(ii) Evaluate $\int Sin^2 x \, dx$

(iii) Evaluate $\int \frac{\sqrt{y}\,(y+1)}{y} dy$

(iv) Find $\int a^{x^2} . x \, dx$

(v) Evaluate $\int \frac{1}{x \ell n x} dx$

(vi) Evaluate $\int e^{-x} (Cos x - Sin x) \, dx$

(vii) Evaluate $\int_{\pi/4}^{\pi/2} Cos t \, dt$

(viii) Evaluate $\int_{-6}^{3} \sqrt{3 - x} \, dx$

(ix) Evaluate $\int_{0}^{\pi/2} Cos^2\theta \, Sin\theta \, d\theta$

(x) Solve the differential equation $x \frac{dy}{dx} = 1 + y$

(xi) Graph the feasible region of system of linear inequalities $x + y \leq 5$, $-2x + y \geq 2$, $x \geq 0$

(xii) What is an Objective Function?

P.T.O.

2016 (A) Roll No: _____

INTERMEDIATE PART-II (12th CLASS)

MATHEMATICS PAPER-II TIME ALLOWED: 2.30 Hours

GROUP-I **SUBJECTIVE** MAXIMUM MARKS: 80

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

SECTION-I

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

(i) Define Even and Odd functions.

(ii) Evaluate $\lim_{x \to 0} \frac{x}{\tan x}$

(iii) Find $\frac{dy}{dx}$ where $y = x^2 \, Sec \, 4x$

(iv) Find $\frac{dy}{dx}$ if $x = y \, Sin \, y$

(v) Discuss the continuity of the function $f(x) = \begin{cases} \frac{x^2 - 9}{x - 3} & ; \ x \neq 3 \\ 6 & ; \ x = 3 \end{cases}$ at $x = 3$

(vi) If $y = \ell n \left(x + \sqrt{x^2 + 1} \right)$; find $\frac{dy}{dx}$

(vii) Differentiate $Sin^3 x$ w.r.t. $Cos^2 x$

(viii) Find $\frac{dy}{dx}$ if $y = \ell n \left(9 - x^2 \right)$

(ix) If $y = e^{-2x} Sin 2x$ then find $\frac{dy}{dx}$

(x) Find $\frac{dy}{dx}$ for $xy + y^2 = 2$

(xi) Differentiate $x^4 + 2x^3 + x^2$ w.r.t. x

(xii) Find $\frac{dy}{dx}$ when $y = \sqrt{x} - \frac{1}{\sqrt{x}}$

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

(i) Find δy if $y = x^2 - 1$ and x changes from 3 to 3.02.

(ii) Evaluate $\int x \left(\sqrt{x} + 1 \right) dx$

(iii) Compute $\int Sin^2 x \, dx$

(iv) Evaluate $\int \frac{1}{\left(1 + x^2 \right) \tan^{-1} x} dx$

(v) Find $\int x \, Cos \, x \, dx$

(vi) Compute $\int e^x \left(Sin x + Cos x \right) dx$

(vii) Compute $\int_{-1}^{1} \left(x^{1/3} + 1 \right) dx$

(viii) Evaluate $\int_{\pi/6}^{\pi/3} Cost \, dt$

(ix) Find the area between X – axis and the curve $y = x^2 + 1$ from $x = 1$ to $x = 2$

(x) Solve the differential equation $\left(x - 1 \right) dx + y dy = 0$

(xi) Define Feasible Region.

(xii) Graph the solution region of $5x - 4y \leq 20$

P.T.O.