Student Roll No				
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

Example Roll No				
2	3	4	7	2
0	0	0	0	0
1	1	1	1	1
●	2	2	2	●
3	●	3	3	3
4	4	●	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	●	7
8	8	8	9	8
9	9	9	9	9

ہال میں موبائل فون لانا بالکل منع ہے Paper Code: 32

MRD-XII-17 (A)

MATHEMATICS – (Part-II)

(Fresh / New Course)

Total Time: 3hrs Total Marks: 100

MAT12A

Time: 20min

"SECTION – A"

Marks: 20

Q. 1 Choose the correct option i.e. A,B,C, and D.

i. If $f(x) = x^2$ then $f(x)$ is .....
Ⓐ One-to-one Ⓑ Onto Ⓒ Many-to-one Ⓓ One-to-many

ii. If $f(x) = x^2-4/x-2$, then $f(2)$ is.....
Ⓐ Zero Ⓑ Two Ⓒ Four Ⓓ Indeterminate

iii. The slope of the secant line is .....rate of change.
Ⓐ Average Ⓑ Instantaneous Ⓒ Total Ⓓ No

iv. If $y=e^x$, then the derivative of $y=e^x$ by first principal rule is.....
Ⓐ 2 Ⓑ 1 Ⓒ 0 Ⓓ -1

v. The r'th derivative of $f(x)=e^{mx}$ is .....
Ⓐ $m^x e^{mx}$ Ⓑ $m^r e^{mx}$ Ⓒ $r^m e^{mx}$ Ⓓ $x^m e^{mx}$

vi. The Taylor series approximation of e^x equal the value of e^x for .....
Ⓐ $x \in [-\infty, \infty]$ Ⓑ $x \in (0, \infty)$ Ⓒ $x \in (-1, 1)$ Ⓓ $x \in (-1, 0)$

vii. A portion of a graph that is cupped upward is called.....
Ⓐ Concave down Ⓑ Concave up Ⓒ Point of inflection Ⓓ Both A & B

viii. The relationship of calculus and vector methods is called.....
Ⓐ Vector calculus Ⓑ Scalar calculus Ⓒ Vector Ⓓ Scalar

ix. $\int \tan x dx =$.....
Ⓐ $\log \cos x + c$ Ⓑ $-\log \cos x + c$ Ⓒ $-\ln|\cos x| + c$ Ⓓ $\ln|\cos x| + c$

x. To evaluate the integral $\int \sqrt{x^2 - 4} dx$ the process of integration is .....
Ⓐ By parts Ⓑ By substitution Ⓒ By partial fraction Ⓓ By power rule

xi. If y=2x+C then value of C for x=4 and y=20 is.....
Ⓐ 20 Ⓑ 12 Ⓒ 8 Ⓓ 4

xii. The centroid of the triangle with vertices (3,-5), (-7, 4) and (10,-2) is .....
Ⓐ (2, 1) Ⓑ (2, -1) Ⓒ (-2, 1) Ⓓ (-2, -1)

xiii. The distance between the two points P (3,-2) and Q (-1,-5) is.....
Ⓐ 25 Ⓑ 5 Ⓒ 49 Ⓓ 9

xiv. The circle equation with center C (0, 0) is.....
Ⓐ $x^2+y^2=4$ Ⓑ $x+y=4$ Ⓒ $x^3+y^3=4$ Ⓓ $x^4+y^4=4$

xv. A point $P(x_1, y_1)$ lies inside the circle $x^2 + y^2 = a^2$, if .....
Ⓐ $x_1^2 + y_1^2 > a^2$ Ⓑ $x_1^2 + y_1^2 \geq a^2$ Ⓒ $x_1^2 + y_1^2 > a$ Ⓓ $x_1^2 + y_1^2 \geq a$

xvi. The parabola $y = ax^2 + bx + c$ opens upward if .....
Ⓐ a > 0 Ⓑ b > 0 Ⓒ c > 0 Ⓓ y > 0

xvii. The focus of parabola $(x-h)^2 = 4p(y-k)$ is .....
Ⓐ $F(h,k)$ Ⓑ $F(h,k+p)$ Ⓒ $F(h+p,k)$ Ⓓ $F(h+p,k+p)$

xviii. The relationship between the two sets of coordinate axes is called the.....of axes.
Ⓐ Translation Ⓑ Rotation Ⓒ Transformation Ⓓ Both A & B

xix. The differential equation $dy/dx=1$ represents a family of straight lines which are .....
Ⓐ Parallel Ⓑ Perpendicular Ⓒ Horizontal Ⓓ Vertical

xx. If $f(x)$ is any continuous function of a single variable x then any number 'r' for which $f(r) = 0$ is called .....
Ⓐ Root of f(x) Ⓑ Factor of f(x) Ⓒ Zero of f(x) Ⓓ Solution of f(x)

BISE-Xii-17(A) 1-239

MATHEMATICS - (Part-II)

(Fresh / New Course)

Time Allowed: 2:40 Hrs | Section – B & C | Total Marks: 80

"Section – B" | Marks: 50

Q. 2 Solve any TEN of the following parts. Each part carries equal marks.

(i) Solve for x, $\log_b x = \frac{2}{3}\log_b 8 + \frac{1}{2}\log_b 9 - \log_b 6$

(ii) Find $\frac{dy}{dx}$, if $y = \ln\sqrt{\frac{x+1}{x-1}}$

(iii) Find the Maclaurin series expansion for the function $f(x) = \sin^2 x$

(iv) If $\vec{v} = 2i - j + 5k$ and $\vec{w} = i + 2j - 3k$ then evaluate $\frac{d^2}{dt^2}\left(t\,|\vec{v}| + t^2\,|w|\right)$

(v) Evaluate: $\int(\tan 3x + \sec 3x)dx$

(vi) Evaluate: $\int_1^4 \frac{\ln x}{x^3}dx$

(vii) Find the angles of the triangle ABC whose vertices are A(3, -4), B(1, 5), C(2, -4)

(viii) Find the equation of circle concentric to $2x^2 + 2y^2 + 16x - 7y = 0$ and is tangent to y-axix.

(ix) Find the equation of set of all points with distance from (4, 3) that equal their distances from (-2, 1).

(x) Translate to parallel axis through the point (3, -4) the conic $x^2 + 2y^2 - 6x + 16y + 39 = 0$

(xi) Solve the homogeneous differential equation $\frac{dy}{dx} = \left(\frac{xy - y^2}{x^2}\right)$

(xii) If $u = \tan^{-1}\left(\frac{x^2 + y^2}{x + y}\right)$ then show that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \tan u$

(xiii) Find the iterate x_3 of the Newton-Raphson iterative method for the function $f(x) = x^3 - 3$ with initial start $x_0 = 1$

"Section – C"

Marks: 30

NOTE: Attempt any three questions. Each question carries equal marks.

Q. 3:

a) Find $\frac{dy}{dx}$ where $y = \frac{1 + \tan 2x}{\operatorname{cosec} 3x}$

b) Find all the relative extrema of $f(x) = x^3 + 6x^2 + 9x + 2$

Q. 4:

a) Evaluate: $\int\sqrt{a^2 + x^2}dx$

b) Evaluate: $\int_{\sqrt{2}}^{2}\frac{dx}{x\sqrt{x^2 - 1}}$

Q. 5:

a) If A(0, 0), B(8, 6), C(12, 0) are the vertices of the triangle ABC, then show that the right bisectors of the sides of the triangle are concurrent.

b) The length of the tangent from (f, g) to the circle $x^2 + y^2 = 6$ is twice the length of the tangent to the circle $x^2 + y^2 + 3x + 3y = 0$, prove that $f^2 + g^2 + 4f + 4g + 2 = 0$

Q. 6:

a) For what value of 'C' the line $x + y + c = 0$ will touch the ellipse $\frac{x^2}{25} + \frac{y^2}{11} = 1$

b) Find the equation of hyperbola with vertices at (2, -2), (-4, -2) and passes through the point (5, 1)

********BEST OF LUCK********