ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

Total Time 3 hours
Total Marks: 100

Class: XII
Time Allowed: 20 minutes
Q1:

MODEL PAPER EXAMINATION 2026
SUBJECT: MATHEMATICS
SECTION "A"

Marks: 20

Note: Attempt **ALL** questions from this section. Each question carries **ONE** mark.

1. The point $(3,3)$ is _____ the circle $x^2 + y^2 = 64$.
   A. Outside B. Inside C. On D. Cannot be determined
2. The perimeter of a rectangle is given by the function $p(x, y) = 2(x + y)$, where x and y are the length and breadth, respectively. What is the sum of the partial derivatives $p(x, y)$ with respect to x and y?
   A. $2x$ B .$2y$ C. $2(x + y)$ D. 4
3. What is the slope of a line perpendicular to a vertical line?
   A. 2 B. ½ C. 90^0 D. Undefined
4. The length of tangent drawn to the circle $x^2 + y^2 + 2y - 1 = 0$ from the point $(5,2)$ is:
   A. $\sqrt{24}$ unit B. $\sqrt{33}$ unit C .$\sqrt{32}$ unit D. $\sqrt{31}$ unit
5. The equation of the tangent to the circle $x^2 + y^2 = 25$ at $(3,4)$ is
   A. $3x + 4y = 0$ B. $4x + 3y = 25$ C. $3x + 4y = 25$ D. $3x + 4y = 5$
6. Let $f(x, y)$and $g(x, y)$ be homogenous functions of degrees 2 and 3, respectively. What is the degree of the homogenous function $\frac{f(x,y)}{g(x,y)}$?
   A. 6 B. 1 C. $\frac{2}{3}$ D. -1
7. In the bisection method, the approximate root is the _____ of the endpoints of the interval in which an actual root lies.
   A. Arithmetic mean B. Geometric mean C. Sum D. Product
8. If $g(x) = 3x + 2$ and $g(f(x)) = x$ then $f(2)$ = _____
   A. 2 B. 6 C. 0 D. 8
9. The area bounded by the curve $y = ln\, ex^2$ from $x = -1$ to $x = 1$ is
   A. $\frac{2}{3}$ B. 1 C. $ln\ 2$ D. $ln\ 3$
10. What point on the line $2x - 3y = 5$ is equidistant from $(1,2)$ and $(3,4)$?
    A. (-2,2) B. (4,1) C. (1,-1) D. (4,6)
11. The center of a circle given by the equation $x^2 + y^2 + 10 - 8y + 1 = 0$ is
    A. (-5,8) B. (-10,8) C. (5,-4) D. (-5,4)
12. In a plane, three or more points are said to be collinear if
    A. They lie on a circle B. They from closed loop tighter
    C. They lie on a straight-line D. They do not make any defined shapes
13. The equation $xy = c^2$ represents a
    A. Parabola B. Ellipse C. Hyperbola D. Circle
14. In the trapezoidal rule, the number of sub-intervals must be a multiple of
    A. 0 B. 1 C. 2 D. 3
15. If a function $f(x)$ satisfies $f(c) = 0$, the point $(c, f(c))$ is referred to as a
    A. Maximum point B. Minimum point C. Stationary point D. Critical point
16. The eccentricity of a rectangular hyperbola is
    A. 1 B. 2 C. $\sqrt{3}$ D. $\sqrt{2}$
17. The center of the circle represented by $x^2 + y^2 + 6x + 8 = 0$ is
    A. On the x-axis B. On the y-axis C. In the first quadrant D. At the origin
18. For what value of k does the circle $x^2 + y^2 + 6x - 4y + k = 0$ have a radius of 5?
    A. 11 B. -12 C. 10 D. 12
19. Two lines are said to be parallel if their slopes are
    A. Equal B. Unequal C. Non-existent D. Negative reciprocals of each other
20. The fastest method to solve the nonlinear equation numerically is:
    A. Bisection Method B. False Position Method
    C. Newton Raphson Method D. Simpson $\frac{1}{3}$ Method

END OF SECTION A

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Total Time 3 hours
Total Marks: 100

Class: XII **MODEL PAPER EXAMINATION 2026**
Time: 2 hours 40 minutes **SUBJECT: MATHEMATICS SECTION "B" AND SECTION "C"** **Total Marks 80**
SECTION "B" SHORT ANSWER QUESTIONS **Marks 50**

Q2:
Note: Attempt any **TEN-PART** questions from this section. All questions carry equal marks.

(i) Evaluate any one of the following limits.
a) $\lim_{x\to 0}\frac{\sqrt{x+3}-\sqrt{3}}{x}$ b) $\lim_{x\to 0}\frac{3sinx-x^3}{2x}$

(ii) Find the equation of the circle whose centre is at its origin and it contains a point (5,6).

(iii) Find the order and degree of $\frac{d^3y}{dx^3}-5\left(\frac{d^2y}{dx^2}\right)^3+7\left(\frac{dy}{dx}\right)^8=0$

(iv) Obtain the first three terms of the Maclaurin's series for e^{sinx}.

(v) Find the values of m and n, so that the given function f is continuous at $x=3$

$$f(x)=\begin{cases} mx & if x<3 \\ n & if x=3 \\ -2x+9 & if\ x>3 \end{cases}$$

(vi) Evaluate $\int\frac{5dx}{25x^2+9}$ by using trigonometric substitution.

(vii) Differentiate $\ln[tanh(x^2+2x+1)]$ with reference to x

(viii) The line through $(6,-4)$ and $(-3,2)$ is parallel to the line through $(2,1)$ and $(y,0)$. Find y.

(ix) A, B and C are three collinear points and the coordinates of A and B are (3,4) and (7,7) respectively. Find the coordinates of C if $|\overline{AC}|=10\ units$.

(x) The area of the triangle is given by formula $A=\frac{1}{2}bh$. Differentiate A with respect to their independent variables.

(xi) Find the equation of the parabola whose vertex is (3,4) and directrix $x=5$.

(xii) Use Bisection method to find a real root of $f(x)=cosx$, [1,2] up to one decimal place (five iterations)

OR

Show that the line $y=2x+4$ is tangent to the ellipse $4x^2+3y^2=12$.Also find the point of contact.

(xiii) Find eccentricity, foci, vertices and latus rectum of $\frac{x^2}{9}-\frac{y^2}{16}=1$

SECTION "C" DETAILED ANSWER QUESTIONS **Marks 30**

Note: Attempt any **FIVE QUESTIONS** from this Section. **Question No.3** is compulsory. All questions carry equal marks.

Q.3 A. Integrate $\int x^2e^xdx$ by parts B. Evaluate $\int\frac{(x^2+2x+3)dx}{x^3-x}$ by using partial fraction

Q.4 Find the area above the x-axis under the following curve $y=5e^{5x}$
$x=-2,\quad x=3$

Q.5 Find the condition of tangency of line $y=mx+c$ to ellipse

$$\frac{x^2}{b^2}+\frac{y^2}{a^2}=1$$

Q.6 Prove that the two circles $x^2+y^2+2gx+c=0$ and $x^2+y^2+2fy+c=0$ touch each other, if $\frac{1}{f^2}+\frac{1}{g^2}=\frac{1}{c}$

Q.7 The gradient of one of the lines of $ax^2+hxy+by^2=0$ is twice that of the other. Show that $8h^2=9ab$

Q.8 Solve the any ONE of the following differential equations:

A. $\frac{dy}{dx}=\left(\frac{y}{x}\right)+sin\left(\frac{y}{x}\right)$ B. $(6x^2+2y^2)dx-(x^2+4xy)dy=0$

Q.9 For what value of k, the line y=2kx will be tangent to $2x^2-5y^2=10$

Q.10 Use Newton Raphson method to find the real root of $f(x)=3x-\sqrt{1+sinx}, x_0=1$

END OF PAPER