ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

Total Time 3 hours
Total Marks: 100

Class: XI
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) For any triangular matrix A, |A| is equal to:
A. Product of leading diagonal elements
B. Sum of leading diagonal elements
C. Sum of square of diagonal elements
D. All of these

2) The multiplicative inverse of $(5, 2)$ is:
A. $(\frac{5}{18}, \frac{2}{18})$ B. $(\frac{5}{25}, \frac{-2}{25})$ C. $(\frac{-5}{25}, \frac{-2}{25})$ D. (1, 0)

3) If A is an idempotent matrix then:
A. $A^2 = I$ B. $A^2 = A$ C. $A^2 = 2A$ D. None

4) A square matrix A is diagonal if:
A. $A^t = -A$
B. $A^2 = A$
C. All diagonal elements are 0
D. Only diagonal elements are non-zero

5) If $Z = 3i - 4$, then $Z + \bar{Z} =$:
A. 8 B. $-3i$ C. -8 D. $3i - 8$

6) If $\vec{a}$ and $\vec{b}$ are orthogonal then $\vec{a} \,.\, \vec{b} =$:
A. ab B. 1 C. 0 D. -1

7) $i.(j \times k) =$
A. j B. $-i$ C. k D. 0

8) If the order of two matrices A and B are $m \times n$ and $n \times q$ respectively, then order of AB is:
A. $m \times q$ B. $n \times m$ C. $q \times m$ D. $q \times q$

9) The H.M between $a \; and \; b$ is:
A. $\frac{3(a+b)}{ab}$ B. $\frac{ab}{a+b}$ C. $\frac{2ab}{a+b}$ D. $\frac{a+b}{ab}$

10) If in a G.P., $a = 3, \; and \; r = \frac{2}{3} \; then \; S$ is equal to:
A. 9 B. 12 C. 15 D. 18

11) The imaginary part of $i(3 + 5i^2)$ is:
A. $-2i$ B. $3i$ C. -2 D. -5

12) Middle term in the expansion of $(a + b)^{2n}$ is:
A. $nth \; term$ B. $(n + 1)th \; term$ C. $(2n + 1)th \; term$ D. None

13) The value of ${}^5P_3$ is:
A. 120 B. 60 C. 20 D. 80

14) A function $f(x) = x^3 + 2x^2 - 5x + 6$ is:
A. Polynomial B. Linear C. Even D. Odd

15) Solution of equation $3sinx + \sqrt{2} = 0$ in the 3rd quadrant.
A. $\frac{-2\pi}{35}$ B. $\frac{-\pi}{4}$ C. $\frac{-\pi}{3}$ D. $\frac{-11\pi}{6}$

16) The period of $5 \tan 8x$ is:
A. $\frac{\pi}{8}$ B. $\frac{\pi}{5}$ C. 5π D. π

17) In Δ ABC if a= 25cm, b=15cm and c= 35cm then the value of 2S is:
A. 30cm B. 25cm C. 40cm D. 75cm

18) The probability of getting a head in a single toss of a coin is:
A. $\frac{1}{4}$ B. $\frac{1}{3}$ C. $\frac{1}{2}$ D. $\frac{2}{5}$

19) $\sin\frac{\alpha}{2} =$?
A. $\sqrt{\frac{s(s-a)}{bc}}$ B. $\sqrt{\frac{(s-b)(s-c)}{ac}}$ C. $\sqrt{\frac{(s-a)(s-b)}{s(s-c)}}$ D. $\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$

20) _____ are the entities whose values are to be determined from the solution of the LP problem.
A. Objective function B. Decision variables C. Constraints D. Opportunity cost

END OF SECTION A

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Total Time 3 hours

Total Marks: 100

Class: XI **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 40**

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

(i) Find the point of intersection where y is function of x

$3x - 2y = 4 \ and \ x = 4y = 6$

(ii) Find out whether the following matrix is idempotent or involuntary: $\begin{bmatrix} -5 & -8 & 0 \\ 3 & 5 & 0 \\ 1 & 2 & -1 \end{bmatrix}$.

(iii) Find the indicated terms in the following harmonic progression:

$\frac{9}{5}, \frac{9}{13}, \frac{9}{21}, \ldots$; 8^{th} term

(iv) Find the area of an equilateral triangle with each side x units long.

(v) Solve the quadratic equation $z^2 - 6z + 34 = 0$ by completing the squares, where z is a complex number.

(vi) There are 11 men and 9 women members of a club. How many committees of 8 members can be formed, if there are?

a) Exactly five men b) at most five women c) At least five women

(vii) Find the area of Triangle ABC when

$c = 36, \quad \alpha = 46°, \quad \beta = 66°$

(viii) The paths of two aeroplanes A and B are determined by the straight lines $2x - y = 6 \ and \ 3x + y = 4$ respectively. Graphically find the point where the two paths cross each other.

(ix) Write in the simplified form the term independent of x in the expansion of $\left(3x + \frac{2}{x^3}\right)^{10}$.

(x) Prove that:

a) $\sin 4\,\theta = 4 \sin\theta \ cos\ \theta \cos 2\,\theta$

b) $\frac{sin\alpha + sin\beta}{sin\alpha - sin\beta} = tan\left(\frac{\alpha+\beta}{2}\right) cot\left(\frac{\alpha-\beta}{2}\right)$

(xi) Find the inverse of $f(x) = \frac{1}{x+3}, x \neq 3$ and verify that $f^{-1}[f(x)] = x$.

(xii) Find the equation of a quadratic function of the form $y = ax^2 + bx + c$ that intersects the x- axis at the points (-2,0) and (6,0).

(xiii) If A + B + C = 90º then prove that $\sin\frac{A}{2} = cot\frac{B+C}{2}$)

(xiv) Find the largest angle of Δ ABC, when $a = 7cm, b = 10cm,$ and $c = 12cm$.

SECTION "C" DETAILED ANSWER QUESTIONS **Marks 40**

NOTE: Attempt any **FIVE QUESTIONS** from this Section. All questions carry equal marks.

Q.3 Solve the non-homogeneous system of linear equations using Gauss- Jordan –method.

$2x + 3y - z = 5 \quad , \quad x - 4y + 2z = -3 \quad , \quad 3x + y + z = 6$

Q.4 If $f: \mathbb{R} \to \mathbb{R}$ is the function defined by $f(x) = 5x + 7$. Find $f^{-1}(x)$ and verify that $f^{-1}[f(x)] = x$.

OR

Find five numbers in A.P, whose sum is 30 and the sum of their squares is 210.

Q.5 A pair of dice is rolled. Find the probability of:

(i) Getting a sum of 8 (ii) Rolling doubles (both dice show the same number)

(iii) Getting a number greater than 4 on at least one die (iv) The product of the two numbers being 12.

Q.6 If $x = \frac{1}{3} + \frac{1.3}{3.6} + \frac{1.3.6}{3.6.9} + \frac{1.3.6.9}{3.6.9.12} + \cdots$, prove that $x^2 + 2x - 2 = 0$.

Q.7 The sides of a parallelogram are 25cm and 35cm long and one of its angles is 36°. Find the length of its diagonals.

Q.8 The number of bacteria in a culture increased in G.P. from 515,000 to 15,45,000 in 7 days. Find the daily rate of increase, assuming the rate of increase to be constant

Q.9 Find and verify the general solution of $2cosx - sin^2x - 1 = 0$.

Q.10 Evaluate without using calculator: $\cos 30° \cos 45° \cos\ 60°$.

END OF PAPER