AIMO 2026

Sample Paper

(Questions from the AIMO 2025 paper)

Mathematics Association, BITS Pilani

Grade 11 & 12

Instructions

- This paper consists of 20 MCQs and 5 numerical-type questions.
- Each question carries 4 marks. For every wrong answer, -1 will be awarded.
- The symbol $[\cdot]$ denotes the **Greatest Integer Function (G.I.F.)** unless stated otherwise.
- The symbol ω represents an imaginary cube root of unity.
- Use of calculators or any electronic gadgets is strictly prohibited.
- Ensure your details are clearly mentioned.

Name: _____ **Roll Number:** _____

Part A

Q1. Let $f(x)$ be a polynomial of degree four having extreme values at $x = 1$ and $x = 2$. If $\lim\limits_{x\to 0}\left[1+\dfrac{f(x)}{x^2}\right] = 3$, then $f(2)$ is equal to:

(1) -4 (2) 0 (3) 4 (4) -8

Q2. The sum of the first 9 terms of the series $\dfrac{1^3}{1}+\dfrac{1^3+2^3}{1+3}+\dfrac{1^3+2^3+3^3}{1+3+5}+\cdots$ is:

(1) 96 (2) 142 (3) 192 (4) 71

Q3. Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be three non-zero vectors such that no two of them are collinear and $(\vec{a}\times\vec{b})\times\vec{c} = \frac{1}{3}|\vec{b}||\vec{c}|\vec{a}$. If θ is the angle between vectors $\vec{b}$ and $\vec{c}$, then a value of $\sin\theta$ is:

(1) $-\frac{\sqrt{2}}{3}$ (2) $\frac{2}{3}$ (3) $-\frac{2\sqrt{3}}{3}$ (4) $\frac{2\sqrt{2}}{3}$

Q4. Let A and B be two sets containing four and two elements respectively. Then the number of subsets of the set $A\times B$, each having at least three elements, is:

(1) 256 (2) 275 (3) 510 (4) 219

Q5. Let α and β be the roots of the equation $x^2-6x-2=0$. If $a_n=\alpha^n-\beta^n$ for $n\geq 1$, then the value of $\dfrac{a_{10}-2a_8}{2a_9}$ is equal to:

(1) -6 (2) 3 (3) -3 (4) 6

Q6. The number of integers greater than 6,000 that can be formed using the digits 3, 5, 6, 7 and 8, without repetition, is:

(1) 192 (2) 120 (3) 72 (4) 216

Q7. The equation of the plane containing the line $2x-5y+z=3;\ x+y+4z=5$, and parallel to the plane $x+3y+6z=1$, is:

(1) $x+3y+6z=-7$ (2) $x+3y+6z=7$

(3) $2x+6y+12z=-13$ (4) $2x+6y+12z=13$

Q8. The area (in sq. units) of the quadrilateral formed by the tangents at the end points of the latera recta to the ellipse $\dfrac{x^2}{9}+\dfrac{y^2}{5}=1$ is:

(1) 18 (2) $\frac{27}{2}$ (3) 27 (4) $\frac{27}{4}$

Q9. The number of points, having both coordinates as integers, that lie in the interior of the triangle with vertices $(0,0)$, $(0,41)$ and $(41,0)$ is:
(1) 861 (2) 820 (3) 780 (4) 901

Q10. Locus of the image of the point $(2,3)$ in the line $(2x-3y+4)+k(x-2y+3)=0$, $k\in\mathbb{R}$, is a:
(1) straight line parallel to the y-axis. (2) circle of radius $\sqrt{2}$.
(3) circle of radius $\sqrt{3}$. (4) straight line parallel to the x-axis.

Q11. The number of common tangents to the circles $x^2+y^2-4x-6y-12=0$ and $x^2+y^2+6x+18y+26=0$ is:
(1) 2 (2) 3 (3) 4 (4) 1

Q12. Let O be the vertex and Q be any point on the parabola $x^2=8y$. If the point P divides the line segment OQ internally in the ratio $1:3$, then the locus of P is:
(1) $y^2=x$ (2) $y^2=2x$ (3) $x^2=2y$ (4) $x^2=y$

Q13. The mean of a data set comprising 16 observations is 16. If one of the observations valued 16 is deleted and three new observations valued 3, 4 and 5 are added to the data, then the mean of the resultant data is:
(1) 16.0 (2) 15.8 (3) 14.0 (4) 16.8

Q14. The sum of coefficients of integral powers of x in the binomial expansion of $(1-2\sqrt{x})^{50}$ is:
(1) $\frac{1}{2}\left(3^{50}\right)$ (2) $\frac{1}{2}\left(3^{50}-1\right)$ (3) $\frac{1}{2}\left(2^{50}+1\right)$ (4) $\frac{1}{2}\left(3^{50}+1\right)$

Q15. The distance of the point $(1,0,2)$ from the point of intersection of the line $\dfrac{x-2}{3}=\dfrac{y+1}{4}=\dfrac{z-2}{12}$ and the plane $x-y+z=16$ is:
(1) 8 (2) $3\sqrt{21}$ (3) 13 (4) $2\sqrt{14}$

Q16. $\displaystyle\lim_{x\to 0}\frac{(1-\cos 2x)(3+\cos x)}{x\tan 4x}$ is equal to:
(1) 3 (2) 2 (3) $\frac{1}{2}$ (4) 4

Q17. The negation of $\sim s\vee(\sim r\wedge s)$ is equivalent to:
(1) $s\wedge(r\wedge\sim s)$ (2) $s\vee(r\vee\sim s)$ (3) $s\wedge r$ (4) $s\wedge\sim r$

Q18. A complex number z is said to be unimodular if $|z|=1$. Suppose z_1 and z_2 are complex numbers such that $\dfrac{z_1-2z_2}{2-z_1\bar{z}_2}$ is unimodular and z_2 is not unimodular. Then the point z_1 lies on a:
(1) straight line parallel to the y-axis. (2) circle of radius 2.
(3) circle of radius $\sqrt{2}$. (4) straight line parallel to the x-axis.

Q19. 12 balls are placed at random into 3 boxes, each ball being equally likely to go into any box. The probability that a particular box contains exactly 3 balls is:
(1) $55\left(\frac{2}{3}\right)^{10}$ (2) $220\left(\frac{1}{3}\right)^{12}$ (3) $22\left(\frac{1}{3}\right)^{11}$ (4) $\frac{55}{3}\left(\frac{2}{3}\right)^{11}$

Q20. If m is the A.M. of two distinct real numbers ℓ and n $(\ell,n>1)$ and G_1, G_2 and G_3 are three geometric means between ℓ and n, then $G_1^4+2G_2^4+G_3^4$ equals:
(1) $4\ell m^2n$ (2) $4\ell mn^2$ (3) $4\ell^2m^2n^2$ (4) $4\ell^2mn$

Part B

Q21. 5 different marbles are placed in 5 different boxes randomly. Each box can hold any number of marbles. If p is the probability that exactly two boxes remain empty, then the value of $\left[\dfrac{1}{p}\right]$ is _____.

Q22. Let $\dfrac{1}{a_1-2i},\dfrac{1}{a_2-2i},\ldots,\dfrac{1}{a_8-2i}$ be the vertices of a regular octagon. If the area of the octagon is $\dfrac{1}{\lambda}$, then the value of $\sqrt{2}\,\lambda$ is _____.

Q23. The sum of the positive roots of the equation $(x^2 - 12x + 35)(x^2 + 10x + 24) = 504$ is equal to R. Then the value of $R - 7$ is _____.

Q24. Let $n > m$ and $f(n, m) = \sum_{k=0}^{n} \left(\sum_{r=0}^{n-m} \binom{k+r}{r} \binom{n-r}{m} \right)$. If $f(100, 50) = \binom{\alpha}{51} - \binom{\beta}{51}$, then the number of odd integral divisors of $\alpha + \beta + 3$ is _____.

Q25. If z_1 and z_2 are two complex numbers such that $|z_1 - z_2| = 4$, $|z_1 - z_2\omega| = 5$ and $|z_1 - z_2\omega^2| = 3$, where ω represents an imaginary cube root of unity, and z_1 lies inside the triangle with vertices z_2, $z_2\omega$, $z_2\omega^2$, then the value of $\left|\left[|z_2|^2 - 4\sqrt{3}\right]\right|$ is _____.

ROUGH WORK

Answer Key

Q	Answer		Q	Answer
1	(2) 0		14	(4) $\frac{1}{2}(3^{50}+1)$
2	(1) 96		15	(3) 13
3	(4) $\frac{2\sqrt{2}}{3}$		16	(2) 2
4	(4) 219		17	(3) $s \wedge r$
5	(2) 3		18	(2) circle of radius 2
6	(1) 192		19	(4) $\frac{55}{3}\left(\frac{2}{3}\right)^{11}$
7	(2) $x+3y+6z=7$		20	(1) $4\ell m^2 n$
8	(3) 27		21	2
9	(3) 780		22	8
10	(2) circle of radius $\sqrt{2}$		23	4
11	(2) 3		24	6
12	(3) $x^2=2y$		25	8
13	(3) 14.0			