

M.SC. (MATHEMATICS) ADMISSION TEST, 2020-2021

Duration : Two Hours

Max Marks: 200

Date of Test : November 11, 2021

Part A: $70 \times 2 = 140$

Time of Test : 09 A.M. – 11 A.M.

Part B: $10 \times 6 = 60$

Particulars to be filled in by the Candidates

Registration No.:

Name of the Candidate:

Father's Name:

Signature of the Candidate

Signature of the Invigilator

Instructions to Candidates

- Answer all Questions.
- The Question paper consists of 11 pages (including the cover page). Count the pages before answering the questions.
- The Question paper consists of two sections namely 'Part A' and 'Part B'.
- Part 'A' of the question paper contains 70 Multiple Choice Questions and Part B contains 10 short answer type questions.
- Each question of Part A is followed by four alternative answers marked as (a), (b), (c) and (d). Select one of the answers which you consider most appropriate and mark in the answer sheet (OMR) provided as per the instructions.
- Selecting more than one answer to a question would result in it being treated as wrong even if one of the choices is correct.
- Use ball point pen for marking the correct answers in the answer sheet.
- Incorrect answers in Part A shall result in a negative score of 25%.
- Part 'B' of the Question paper contains 10 short answer type questions. Answer all the questions in the answer booklet provided separately.
- The answer booklet along with the answer sheet (OMR) must be handed over to the invigilator before leaving the examination hall.
- No request for re-evaluation/rechecking of the answer sheet shall be entertained.

PART-A

- $\lim_{x \rightarrow \infty} x \tan\left(\frac{1}{x}\right) =$
(a) 0 (b) 1
(c) ∞ (d) none of these.
- An asymptote of the curve $x^3 + y^3 = 3axy$ is
(a) $x + y = a$ (b) $x + y = 3a$
(c) $x + y = a^3$ (d) $x + y + a = 0$.
- The expansion of $\tan x$ in powers of x by Maclaurin's Series is valid in the interval
(a) $(-\infty, \infty)$ (b) $(-\pi/2, \pi/2)$
(c) $(-\pi, \pi)$ (d) $(-\pi/2, \pi/2)$.
- The function $y = x^5 + x + 1$ has a point of inflection at
(a) $x = 0$ (b) $x = 1$
(c) $x = -1$ (d) none of these.
- If a function is continuous in the closed interval $[a, b]$, then it attains its bounds in the interval
(a) atleast twice (b) atleast once
(c) atleast thrice (d) atleast four times.
- The value of the double integral $\int_0^1 \int_0^{\sqrt{1-x^2}} (x^2 + y^2) dy dx$ is
(a) π (b) $\pi/2$
(c) $\pi/4$ (d) $\pi/8$.
- The value of the integral $\int_C (x + y - z) dx$, where $C: \vec{r}(t) = t\hat{i} - \hat{j} + t^2\hat{k}$, $0 \leq t \leq 1$ is
(a) $5/6$ (b) $-5/6$
(c) $1/3$ (d) $-1/3$.
- Consider the following statements:
I: A function $f(x, y)$ can not have partial derivatives with respect to both x and y at a point P if it is not continuous at P .
II: A function f increases most rapidly in the direction of the gradient vector ∇f at a point P .
(a) both I and II are true (b) I is true but II is false
(c) I is false but II is true (d) both I and II are false.
- The flux of $F = (x - y)\hat{i} + x\hat{j}$ across the circle $x^2 + y^2 = 1$ in the xy -plane is
(a) π (b) $\pi/2$
(c) $3\pi/2$ (d) 2π .
- The function $f(x, y) = x^3 - y^3 + 3x^2 + 3y^2 - 9x$ has a
(a) local maxima at $(1, 0)$ (b) local minima at $(-3, 2)$
(c) saddle point at $(1, 0)$ (d) saddle point at $(1, 2)$.

- Consider the following statements:
I: A bounded sequence can not have a divergent subsequence.
II: If a series is convergent, then its every rearrangement is convergent.
(a) I is correct but not II (b) II is correct but not I
(c) both I and II are correct (d) neither I nor II is correct.
- The series $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \frac{1}{6} + \dots$
(a) is convergent (b) is divergent
(c) oscillates finitely (d) oscillates infinitely.
- Which of the following is not correct?
(a) A bounded sequence has atleast one convergent subsequence
(b) A monotone sequence can not oscillate
(c) A sequence is convergent if and only if it is monotonic and bounded.
(d) A sequence has a limit point l if l is the limit point of its range.
- Which of the following statement is correct?
(a) A continuous function is a function of bounded variation.
(b) A function of bounded variation is continuous
(c) If f is Riemann integrable over $[a, b]$, then $g(x) = \int_a^x f(x) dx$ is not differentiable
(d) A monotone function cannot have a discontinuity of II-kind.
- The limit of a sequence $\{a_n\}$, where $a_n = \frac{(n!)^{\frac{1}{n}}}{(n+1)}$, is
(a) e (b) $\frac{1}{e^2}$
(c) e^2 (d) $\frac{1}{e}$.
- The inverse of the element $\begin{pmatrix} 2 & 6 \\ 3 & 2 \end{pmatrix}$ in $GL_2(\mathbb{Z}_{11})$ is
(a) $\begin{pmatrix} 9 & 0 \\ 10 & 5 \end{pmatrix}$ (b) $\begin{pmatrix} 5 & -6 \\ -3 & 2 \end{pmatrix}$
(c) $\begin{pmatrix} 9 & 9 \\ 10 & 8 \end{pmatrix}$ (d) $\begin{pmatrix} 2 & 6 \\ 3 & 5 \end{pmatrix}$.
- Let $G = \mathbb{Z}_5 = \{1, 2, 3, 4\}$. If $\alpha: G \rightarrow G$ is defined by $\alpha(g) = g^3$ for all $g \in G$. Then
(a) α is a one-one homomorphism but not onto
(b) α is an onto homomorphism but not one-one
(c) α is one-one and onto but not a homomorphism
(d) α is an isomorphism.
- Let $\pi = (3 \ 7 \ 1 \ 2 \ 5)(4 \ 3 \ 2 \ 1 \ 6) \in S_7$, the symmetric group on 7 symbols. Then the order of π is
(a) 7 (b) 4
(c) 5 (d) 9.

19. In the group $G = \left\{ \begin{pmatrix} a & a \\ a & a \end{pmatrix} \mid 0 \neq a \in R \right\}$ with respect to matrix multiplication, the identity element is

- (a) $\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} 1/2 & 1/2 \\ 1/2 & 1/2 \end{pmatrix}$
 (c) $\begin{pmatrix} 1/3 & 1/3 \\ 1/3 & 1/3 \end{pmatrix}$ (d) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

20. If in a group G , $x^3 = e$ and $xyx^{-1} = y^2$ for all $x, y \in G$. then the order of y is

- (a) 30 (b) 31
 (c) 32 (d) 33

21. If a tangent to the parabola $y^2 = 8x$ makes an angle 45° with x -axis, then its point of contact is

- (a) (1,2) (b) (2,1)
 (c) (2,4) (d) (4,2)



22. The equation $x^2 + y^2 + 4x + 6y + 13 = 0$ represents

- (a) a pair of coincident straight lines (b) a parabola
 (c) a point circle (d) an ellipse.

23. All chords of the curve $3x^2 - y^2 - 2x + 4y = 0$ which subtend a right angle at the origin pass through

- (a) (1,2) (b) (1,-2)
 (c) (-1,-2) (d) (1,1).

$$\begin{array}{l} 3x^2 - y^2 - 2x + 4y = 0 \\ 3x^2 - y^2 - 2x + 4y = 0 \\ 3x^2 - y^2 - 2x + 4y = 0 \end{array}$$

24. Examine the following statements

I. If $(5, \pi/4)$, $(-5, -3\pi/4)$ are the polar coordinates of A and B , then A and B are distinct.

II. The equation $4x^2 - y^2 - z^2 - 2yz = 0$ represents a cone.

III. The lines $y = 2x$ and $y = 3x$ are conjugate diameters of the ellipse $2x^2 + 3y^2 = 1$.

Which of the above statement/statements is/are not correct?

- (a) I, II and III (b) I and II only
 (c) II and III only (d) II only.

25. If $x = a(t + \frac{1}{t})$ and $y = a(t - \frac{1}{t})$, then the locus of the point (x, y) is

- (a) $x^2 + y^2 = 4a^2$ (b) $x^2 - y^2 = a^2$
 (c) $4x^2 - y^2 = a^2$ (d) $x^2 - y^2 = 4a^2$

26. Let $X = N \times \{0, 1\}$. Define a relation R on X as : $(a, b)R(c, d)$ if $a < c$ or $(a = c$ and $b < d)$, where $<$ is the usual relation on N . Then R is

- (a) reflexive but not transitive (b) transitive but not reflexive
 (c) reflexive and transitive (d) neither reflexive nor transitive.

27. Which of the following is a correct statement regarding a map $f : A \rightarrow B$?

- (a) If f is injective, then its any extension is also injective
 (b) Every extension of f is unique
 (c) If f is bijective, then its any extension is also bijective
 (d) If f is injective, then its any restriction is also injective.

28. Let $(X = \{2, 4, 6, 12\}, R)$ be a partially ordered set, where R is defined on X as follows: $a, b \in X, aRb$ if and only if $a|b$ i.e., a divides b . Then which of the following is a correct statement?

- (a) X is a totally ordered set.
 (b) X is a well ordered set.
 (c) 2 is the first element of X .
 (d) the set of all minimal elements is not a singleton set.

29. Consider a set $A = \{1, 2, 3, 4, \dots, 26\}$ and let R be an equivalence relation on A defined as follows : $x, y \in A, xRy$ if and only if $4|(x - y)$. The equivalence class determined by 19 i.e. $[19]$ will be

- (a) $\{19, 7, 15, 3, 11\}$ (b) $\{11, 7, 15, 13, 19\}$
 (c) $\{19, 13, 7, 6, 1\}$ (d) $\{5, 12, 17, 9, 19\}$

30. The last digit of $(38)^{1031}$ is

- (a) 6 (b) 2
 (c) 4 (d) 8.

31. The remainder, when $98!$ is divided by 101 is

- (a) 20 (b) 35
 (c) 40 (d) 50.

32. There is an integer x such that

- (a) $x \equiv 23 \pmod{1000}$ and $x \equiv 45 \pmod{6789}$
 (b) $x \equiv 23 \pmod{1000}$ and $x \equiv 54 \pmod{6799}$
 (c) $x \equiv 32 \pmod{1000}$ and $x \equiv 44 \pmod{9876}$
 (d) $x \equiv 32 \pmod{1000}$ and $x \equiv 54 \pmod{9876}$
 which of the above statement is false?

33. Let Z be the ring of integers. Which of the following is an integral domain?

- (a) Quotient ring $\frac{Z}{6Z}$.
 (b) $Z \times Z$.
 (c) The ring of all 2×2 diagonal matrices with entries from Z .
 (d) The polynomial ring $Z[x]$.

34. Let $Z_8 = \{0, 1, 2, 3, 4, 5, 6, 7\}$ be the ring of residue classes modulo 8. Which one among the following is not a correct statement regarding Z_8 ?

- (a) $1, 3, 5, 7$ are the only units of Z_8 .
 (b) 4 is the only element which is reducible but not prime.
 (c) 2 and 6 are the only elements which are both prime and irreducible.
 (d) 2 and 6 are associates of each other because $2|6$ and $6|2$.

$$\begin{array}{l} A) 184 \times 258 \\ 184 \times 200 = 36800 \\ 184 \times 50 = 9200 \\ 184 \times 8 = 1472 \\ \hline 47472 \end{array}$$

35. In the ring of integers, which of the following is not correct?

- (a) Every prime ideal is maximal.
- (b) Every maximal ideal is prime.
- (c) Every non-zero prime ideal is maximal.
- (d) Zero ideal is a prime ideal.

36. Let $f: R_1 \rightarrow R_2$ be a ring homomorphism. Then which of the following statement is not correct?

- (a) If R_1 is a field, then f is either injective or a zero homomorphism.
- (b) If I is an ideal of R_1 , then $f(I)$ is an ideal of R_2 .
- (c) If S is a subring of R_2 , then $f^{-1}(S)$ is a subring of R_1 .
- (d) If R_1 has identity 1 and f is onto, the $f(1)$ is the identity of R_2 .

37. The number of surjective ring homomorphism that can be defined from Z_7 to Z_3 will be

- (a) 0
- (b) 3
- (c) 7
- (d) 21.

38. In R^3 consider the following statements on the subset

$$S = \{(1, 0, 0), (0, 1, 0), (0, 0, 1), (1, 1, 1), (1, 1, 0)\}.$$

- I. S is linearly dependent.
 - II. All subsets of S containing three vectors are linearly independent.
 - III. All subsets of S containing four vectors are linearly dependent.
- Which of the following is correct

- (a) I, II and III
- (b) I and II
- (c) I and III
- (d) II and III.

39. Let V be any finite dimensional vector space and $T: V \rightarrow V$ be a linear map such that $T^2x = 0 \Rightarrow Tx = 0$. Then which of the following is not correct?

- (a) $r(T) = r(T^2)$
- (b) $R(T) \cap \ker(T) = \{0\}$
- (c) $R(T^2) \cap \ker(T^2) = \{0\}$
- (d) $R(T^2) \cap \ker(T^2) \neq \{0\}$.

40. Let R^2 be a vector space over R and $B = \{(2, 1), (3, 2)\}$ be an ordered basis. Let $T: R^2 \rightarrow R^2$ be the linear transformation which reflects R^2 about x -axis. Then $[T]_B$, the matrix of T with respect to the basis B

- (a) is of rank 1
- (b) is similar to $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$
- (c) has determinant 5
- (d) none of the these.

41. Let $V = Z_3 \times Z_3$ be a vector space over Z_3 , where $Z_3 = \{\bar{0}, \bar{1}, \bar{2}\}$ is the field of residue classes modulo 3 and $W = \{(\bar{1}, \bar{1})\}$ is a subspace of V . The number of elements in the quotient space $\frac{V}{W}$ will be

- (a) 6
- (b) 4
- (c) 2
- (d) 3.

42. Let A be a matrix of order $m \times n$ of rank r . Then which of the following statements is incorrect?

- (a) The dimension of column space of A is r .
- (b) The row rank of A is r .
- (c) There exists a nonzero minor of A of order r .
- (d) The maximum number of linearly independent rows of A is less than r .

43. The rank of the linear transformation $T: R^3 \rightarrow R^4$ defined by

$$T(x_1, x_2, x_3) = (x_1 - x_2, x_2 + x_3, x_1 + x_2 + x_3)$$

- (a) 1
- (b) 2
- (c) 3
- (d) none of these.

44. The angle between the lines $x + y + z = 0$, $yz + zx - 2xy = 0$ is

- (a) $\pi/6$
- (b) $\pi/4$
- (c) $\pi/3$
- (d) $\pi/2$.

45. The lines given by $x - y - z = 0$, $ayz + bzx + cxy = 0$ are at right angles if

- (a) $a = b + c$
- (b) $a = b - c$
- (c) $c = \frac{1}{2}(a - b)$
- (d) $b = \frac{1}{2}(a + c)$.

46. The point of contact of the plane $4x - 6y + 3z = 5$ and the conicoid $2x^2 - 6y^2 + 3z^2 = 5$ is

- (a) (1, 1, 1)
- (b) (1, 2, 1)
- (c) (2, 1, 1)
- (d) (2, 2, 2).

47. Let $D = \frac{d}{dx}$. Then the value of $\left\{\frac{1}{x^2+1}\right\} x^{-1}$ is

- (a) $\log x$
- (b) $\frac{\log x}{x}$
- (c) $\frac{\log x}{x^2}$
- (d) $\frac{\log x}{x^3}$.

48. The differential equation $\left|\frac{dy}{dx}\right| + |y| = 0$, $y(0) = 1$ has

- (a) no solution
- (b) unique solution
- (c) finite number of solutions
- (d) infinite number of solutions.

49. The number of linearly independent solutions of the differential equation

$$x^3 \frac{d^3 y}{dx^3} - 6x \frac{dy}{dx} + 12y = 0$$

of the form $y = x^r$ are

- (a) 0
- (b) 1
- (c) 2
- (d) 3.

50. If $y = x$ is a solution of the differential equation

$$\frac{d^2y}{dx^2} - \left(\frac{2}{x^2} + \frac{1}{x}\right) \left(x \frac{dy}{dx} - y\right) = 0 \quad (0 < x < \infty),$$

then its general solution is

- (a) $(\alpha + \beta e^{-2x})x$ (b) $(\alpha + \beta e^{2x})x$
(c) $(\alpha x + \beta e^x)$ (d) $(\alpha e^x + \beta)x$

51. If $y(x) = \lambda e^{2x} + e^{\beta x}$ ($\beta \neq 2$) is a solution of the differential equation

$$\frac{d^2y}{dx^2} + \frac{dy}{dx} - 6y = 0 \text{ satisfying } y'(0) = 5, \text{ then } y(0) \text{ is equal to}$$

- (a) 1 (b) 4
(c) 5 (d) 9

52. A bounded solution to the partial differential equation $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2} + e^{-t}$ is

- (a) $u(x, t) = -e^{-t}$ (b) $u(x, t) = e^{-x}e^{-t}$
(c) $u(x, t) = e^{-x} + e^{-t}$ (d) $u(x, t) = x + e^{-t}$

53. The integral surface to the first order partial differential equation

$$2y(z-3)\frac{\partial z}{\partial x} + (2x-z)\frac{\partial z}{\partial y} = y(2x-3)$$

passing through the curve $x^2 + y^2 = 2z$, $z = 0$ is

- (a) $x^2 + y^2 - z^2 - 2x + 4z = 0$ (b) $x^2 + y^2 - z^2 - 2x + 8z = 0$
(c) $x^2 + y^2 + z^2 - 2x + 16z = 0$ (d) $x^2 + y^2 + z^2 - 2x + 18z = 0$

54. The solution of partial differential equation $(x^2 - y^2 - z^2)\frac{\partial z}{\partial x} + 2xy\frac{\partial z}{\partial y} = 2xz$ is

- (a) $\phi\left(yz, \frac{x^2 + y^2 + z^2}{z}\right) = 0$ (b) $\phi\left(xy, \frac{x^2 + y^2 + z^2}{z}\right) = 0$
(c) $\phi\left(\frac{x}{y}, \frac{x^2 + y^2 + z^2}{x}\right) = 0$ (d) $\phi\left(\frac{y}{z}, \frac{x^2 + y^2 + z^2}{x}\right) = 0$

55. If α is the angle which the resultant of the forces P and Q makes with P , then $\tan \alpha$ is equal to

- (a) $\frac{Q \cos \alpha}{P + Q \sin \alpha}$ (b) $\frac{Q \sin \alpha}{P + Q \cos \alpha}$
(c) $\frac{Q}{P + Q \cos \alpha}$ (d) $\frac{Q + P \sin \alpha}{P + Q \cos \alpha}$

56. A ball moving with a velocity v_1 on a horizontal plane collides with a fixed ball directly and as a result of the collision, the two balls start moving in the direction of v_1 with velocity v'_1 and v'_2 respectively. Then the coefficient of restitution ϵ is given by

- (a) $\frac{v'_1 + v'_2}{v_1}$ (b) $\frac{v_1}{v'_1 - v'_2}$
(c) $\frac{v'_2 - v'_1}{v_1}$ (d) $\frac{v'_1 - v'_2}{v_1}$

57. A 10 kg vertical force is applied to the end A of a lever which is attached to a shaft at O . If OA is 36 cm. long and makes 45° with the horizontal, then the moment of force about O is

- (a) $180\sqrt{2}$ (b) $181\sqrt{2}$
(c) $182\sqrt{2}$ (d) $183\sqrt{2}$

58. Let $Y = [0, 1]$ be a subspace of R with usual metric. Then the set $A = [0, \frac{1}{4}]$ is

- (a) closed in Y (b) open in Y but not in R
(c) closed in Y and R (d) open in Y and R

59. Q is a subset of the metric space R (with usual metric). Then the set of isolated points of Q is

- (a) Q (b) ϕ
(c) R (d) N

60. Which of the following statements is not correct?

- (a) Let A be a subset of a metric space X . Then A is nowhere dense in X if and only if $X \setminus \bar{A}$ is dense in X .
(b) Let A be a closed subset of a metric space X . Then A is nowhere dense in X if and only if $X \setminus A$ is dense in X .
(c) If $X \setminus A$ is dense in X for any subset A of a metric space X , then A is nowhere dense in X .
(d) The set of all rational numbers Q in R is of first category.

61. The open sphere $S_1(x_0)$ with centre at x_0 and radius 1 in a metric space X is

- (a) compact (b) not compact
(c) closed (d) none of the above

62. If a function f is analytic within and on a simple closed contour C , then $\int_C f(z) dz$ is

- (a) 0 (b) $2\pi i$
(c) 1 (d) -1

63. If $\left(\frac{1-i}{1+i}\right)^{100} = a + ib$, then

- (a) $a = 2, b = -1$ (b) $a = 1, b = 0$
(c) $a = 0, b = 1$ (d) $a = -1, b = 2$

64. The harmonic conjugate of the function $u(x, y) = x^3 - 3x^2y - 3xy^2 - y^3$ is

- (a) $x^3 - 3x^2y + 3xy^2 - y^3$ (b) $x^3 - 3x^2y - 3xy^2 + y^3$
(c) $x^3 + 3x^2y - 3xy^2 - y^3$ (d) $x^3 + 3x^2y + 3xy^2 - y^3$

65. Which of the following is not an entire function?

- (a) $f(z) = e^z$ (b) $f(z) = e^{-z}$
(c) $f(z) = e^{iz}$ (d) $f(z) = e^{\bar{z}}$

66. The value of integral $\oint_C \frac{e^z}{z+1} dz$, $C : |z + \frac{1}{2}| = 1$, is

- (a) $2\pi i$ (b) 0
(c) $2\pi i e^{-1}$ (d) 1.

67. Let $C : \bar{r} = \bar{r}(s)$ be a regular curve with curvature k and torsion τ . Then $\frac{d^3 \bar{r}}{ds^3}$ is given by

- (a) $K'\bar{t} - K^2\bar{n} + K\tau\bar{b}$ (b) $K^2\bar{t} - K'\bar{n} + K\tau\bar{b}$
(c) $\tau^2\bar{t} + K'\bar{n} - K\tau\bar{b}$ (d) $-K^2\bar{t} + K'\bar{n} + K\tau\bar{b}$

68. If the coefficients of second fundamental form on a surface are zero, then the surface is

- (a) a sphere (b) a cylinder
(c) hyperboloid of two sheets (d) a plane.

69. If the osculating plane of a curve on a surface contains the normal to the surface, then the curve is a

- (a) circle (b) straight line
(c) parabola (d) geodesic.

70. If K denotes the Gaussian Curvature of a surface, then which of the following statements is true?

- (a) $K > 0$ at elliptic points (b) $K < 0$ at hyperbolic points
(c) $K = 0$ at parabolic points (d) all the above.

PART-B

71. Show that, for any value of θ , the straight line

$$3(\cos \theta)x + 2(\sin \theta)y - 6 = 0$$

touches the ellipse $9x^2 + 4y^2 - 36 = 0$.

72. Find the value of a for which the curvature of the helix $x = a \cos t, y = a \sin t, z = 5t, (a > 0)$ is maximum. Compute that maximum value of the curvature.

73. Prove that there exists no nonzero linear transformation $T : R^2 \rightarrow R^2$ such that $T(a, b) = (0, 0)$ for all (a, b) lying on the straight line $2x + 3y + 5 = 0$, where R^2 is a vector space over R .

74. If $y(x)$ satisfies the initial value problem

$$(x^2 + y)dx = xdy, \quad y(1) = 2,$$

then find the value of $y(2)$.

75. Let $G = Z_4 \times Z_2$, $H = \langle (2, 1) \rangle$ and $K = \langle (2, 0) \rangle$. Then prove or disprove that G/H is isomorphic to G/K .

76. Using division algorithm, show that the square of any odd integer is of the form $8k+1$ for some integer k .

77. Find \limsup and \liminf of the sequence $\{a_n\}$, where

$$a_n = \cos n\pi + \frac{(-1)^n}{n}.$$

78. Let $f : Q[x] \rightarrow Q[\sqrt{7}]$ be a ring homomorphism such that $f(P(x)) = P(\sqrt{7})$. Prove that $\text{Ker } f$ is a principal ideal generated by $(x^2 - 7)$.

79. Prove that every Cauchy sequence in a discrete metric space is convergent.

80. Evaluate the integral

$$\frac{i}{(4 - \pi)} \int_{|z|=4} \frac{dz}{z \cos z}.$$





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ALIGARH MUSLIM UNIVERSITY Admission Test-Answer Sheet



PLEASE READ THE INSTRUCTIONS PROVIDED ON THE BACK OF THE OMR ANSWER SHEET BEFORE FILLING

1. NAME OF THE CANDIDATE

2. FOR CANDIDATE ONLY

An Institute of Science & Commerce

FOR INVIGILATOR ONLY

BAR CODE

6. QUESTION BOOKLET NUMBER

Signature with date

CANDIDATE'S ROLL NUMBER

2061258

3. ROLL NUMBER

4. APPLICATION NO.

ROOM NO.

Certified that the entries and bubbles have been filled / marked correctly

Signature with date
(Do not Sign out of this box)

5. Gender
(Male/Female/Other)

Male ☐
Female ☐
Other ☐

8. QUESTION PAPER SERIES

9. Status
(Internal / External)

Internal ☐
External ☐

ANSWER SECTION

1	A	51	A	101	A	151	A	201	A
2	B	52	B	102	B	152	B	202	B
3	C	53	C	103	C	153	C	203	C
4	D	54	D	104	D	154	D	204	D
5	A	55	A	105	A	155	A	205	A
6	B	56	B	106	B	156	B	206	B
7	C	57	C	107	C	157	C	207	C
8	D	58	D	108	D	158	D	208	D
9	A	59	A	109	A	159	A	209	A
10	B	60	B	110	B	160	B	210	B
11	C	61	C	111	C	161	C	211	C
12	D	62	D	112	D	162	D	212	D
13	A	63	A	113	A	163	A	213	A
14	B	64	B	114	B	164	B	214	B
15	C	65	C	115	C	165	C	215	C
16	D	66	D	116	D	166	D	216	D
17	A	67	A	117	A	167	A	217	A
18	B	68	B	118	B	168	B	218	B
19	C	69	C	119	C	169	C	219	C
20	D	70	D	120	D	170	D	220	D
21	A	71	A	121	A	171	A	221	A
22	B	72	B	122	B	172	B	222	B
23	C	73	C	123	C	173	C	223	C
24	D	74	D	124	D	174	D	224	D
25	A	75	A	125	A	175	A	225	A
26	B	76	B	126	B	176	B	226	B
27	C	77	C	127	C	177	C	227	C
28	D	78	D	128	D	178	D	228	D
29	A	79	A	129	A	179	A	229	A
30	B	80	B	130	B	180	B	230	B
31	C	81	C	131	C	181	C	231	C
32	D	82	D	132	D	182	D	232	D
33	A	83	A	133	A	183	A	233	A
34	B	84	B	134	B	184	B	234	B
35	C	85	C	135	C	185	C	235	C
36	D	86	D	136	D	186	D	236	D
37	A	87	A	137	A	187	A	237	A
38	B	88	B	138	B	188	B	238	B
39	C	89	C	139	C	189	C	239	C
40	D	90	D	140	D	190	D	240	D
41	A	91	A	141	A	191	A	241	A
42	B	92	B	142	B	192	B	242	B
43	C	93	C	143	C	193	C	243	C
44	D	94	D	144	D	194	D	244	D
45	A	95	A	145	A	195	A	245	A
46	B	96	B	146	B	196	B	246	B
47	C	97	C	147	C	197	C	247	C
48	D	98	D	148	D	198	D	248	D
49	A	99	A	149	A	199	A	249	A
50	B	100	B	150	B	200	B	250	B

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