

GATE 2026 MA Question Paper

Time Allowed :3 Hour	Maximum Marks :100	Total Questions :65
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General Instructions

Please read the following instructions carefully:

1. This question paper is divided into three sections:
 - **General Aptitude (GA):** 10 questions (5 questions \times 1 mark + 5 questions \times 2 marks) for a total of 15 marks.
 - **Environmental Science and Engineering + Engineering Mathematics:**
 - **Part A (Mandatory):** 36 questions (1 questions \times 1 mark + 19 questions \times 2 marks) for a total of 55 marks.
 - **Part B (Section 1):** Candidates can choose either Part B1 (Surveying and Mapping) or Part B2 (Section 2). Each part contains 16 questions (8 questions \times 1 mark + 11 questions \times 2 marks) for a total of 30 marks.
2. The total number of questions is **65**, carrying a maximum of **100 marks**.
3. The duration of the exam is **3 hours**.
4. Marking scheme:
 - For 1-mark MCQs, $\frac{1}{3}$ mark will be deducted for every incorrect response.
 - For 2-mark MCQs, $\frac{2}{3}$ mark will be deducted for every incorrect response.
 - No negative marking for numerical answer type (NAT) questions.
 - No marks will be awarded for unanswered questions.
5. Ensure you attempt questions only from the optional section (Part B1 or Part B2) you have selected.
6. Follow the instructions provided during the exam for submitting your answers.

1. Let A be a square matrix. If $A^2 = A$, then the matrix A is called:

- (A) Nilpotent
- (B) Idempotent
- (C) Involutory
- (D) Singular

2. The limit $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ is equal to:

- (A) 0
- (B) 1
- (C) ∞
- (D) Does not exist

3. A continuous function on a closed and bounded interval is always:

- (A) Differentiable
- (B) Monotonic
- (C) Bounded and attains its bounds
- (D) Periodic

4. The general solution of $\frac{dy}{dx} = y$ is:

- (A) $y = x + C$
- (B) $y = Ce^x$
- (C) $y = Cx$
- (D) $y = e^{Cx}$

5. If a function is analytic in a domain, then it is necessarily:

- (A) Continuous only
- (B) Differentiable only once
- (C) Infinitely differentiable
- (D) Bounded

6. If two events A and B are independent, then:

- (A) $P(A \cap B) = P(A) + P(B)$
- (B) $P(A \cap B) = P(A)P(B)$
- (C) $P(A|B) = P(A) + P(B)$
- (D) $P(A \cup B) = P(A)P(B)$

7. Which method is commonly used to find roots of nonlinear equations?

- (A) Euler's method
- (B) Runge–Kutta method
- (C) Newton–Raphson method
- (D) Gauss elimination method

8. Let P be a reflection (or projection) from \mathbb{R}^3 to \mathbb{R}^3 through a two-dimensional subspace. Then find the value of $2\text{tr}(P) - 3\det(P)$.

9. Let $f : D \rightarrow D$ where D is the open unit disc in \mathbb{C} , and $f(0) = 0$. Then possible values of $f'(0)$?

- (A) $i/10$
- (B) $5/(2i)$
- (C) $-5/(2i)$
- (D) $3/(2i)$

10. Let $f(z) = |z|^2 - 5\bar{z} + 2$. Then $f(z)$ is differentiable at

- (A) $z = 5$
- (B) $z = -5i$
- (C) $z = 5i$
- (D) $z = -5$

11. Consider the power series $\sum a_n(z - 2)^n$. It converges at $z = 5$ and diverges at $z = -1$. Find the radius of convergence (ROC).