

## TS PGECET 2025 Question Paper

<b>Time Allowed :2 Hours</b>	<b>Maximum Marks :120</b>	<b>Total questions :120</b>
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### General Instructions

**Read the following instructions very carefully and strictly follow them:**

1. **Mode of Examination:** Online (Computer-based examination)
2. **Medium of Exam:** English
3. **Duration of Exam:** 2 hours
4. **Type of Questions:** Multiple-choice questions
5. **Number of Questions:** 120 Questions
6. **Total Marks:** 120 Marks
7. **Marking Scheme:**
  - 1 mark for each correct answer.
  - No negative markings for incorrect answers.

**1. Determine the rank of the matrix:**

$$\begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{pmatrix}$$

- (1) 1
  - (2) 2
  - (3) 3
  - (4) 0
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**2. Evaluate the integral:**

$$\int_0^1 x e^x dx$$

- (1)  $e - 1$
  - (2)  $e$
  - (3)  $e - 2$
  - (4)  $2e - 1$
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**3. Solve the differential equation:**

$$\frac{d^2 y}{dx^2} - 4y = 0$$

- (1)  $y = C_1 e^{2x} + C_2 e^{-2x}$
  - (2)  $y = C_1 \cos(2x) + C_2 \sin(2x)$
  - (3)  $y = C_1 e^x + C_2 e^{-x}$
  - (4)  $y = C_1 e^{4x} + C_2 e^{-4x}$
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**4. A bag contains 3 red and 2 blue balls. Two balls are drawn without replacement.**

**What is the probability that both are red?**

- (1)  $\frac{3}{10}$
  - (2)  $\frac{1}{5}$
  - (3)  $\frac{2}{5}$
  - (4)  $\frac{1}{10}$
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**5. Use Newton-Raphson method to find the root of  $f(x) = x^3 - x - 2 = 0$  starting with  $x_0 = 1$  after one iteration.**

- (1) 1.5
  - (2) 1.333
  - (3) 1.25
  - (4) 1.4
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**6. What is the time complexity of inserting an element into a balanced binary search tree?**

- (1)  $O(\log n)$
  - (2)  $O(n)$
  - (3)  $O(n \log n)$
  - (4)  $O(1)$
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**7. Which algorithm is used for finding the shortest path in a weighted graph with negative edges?**

- (1) Bellman-Ford
  - (2) Dijkstra's
  - (3) Kruskal's
  - (4) Prim's
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**8. What is the role of the page table in an operating system?**

- (1) Maps virtual addresses to physical addresses
  - (2) Stores process executable code
  - (3) Manages CPU scheduling
  - (4) Handles file system operations
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**9. What is the purpose of the subnet mask in IP addressing?**

- (1) To separate network and host portions of an IP address
  - (2) To encrypt data packets
  - (3) To assign IP addresses dynamically
  - (4) To route packets between networks
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**10. What is a primary key in a relational database?**

- (1) A unique identifier for each record in a table
  - (2) A key used for sorting records
  - (3) A key linking two tables
  - (4) A key for encrypting data
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