GATE 2026 Mechanical Engineering Question Paper

Time Allowed :3 Hours	**Maximum Marks :**100	**Total Questions :**65

General Instructions

Read the following instructions very carefully and strictly follow them:

1. Each GATE 2024 paper consists of a total of 100 marks. The examination is divided into two sections – General Aptitude (GA) and the Candidate's Selected Subjects. General Aptitude carries 15 marks, while the remaining 85 marks are dedicated to the candidate's chosen test paper syllabus.
2. GATE 2024 will be conducted in English as a Computer Based Test (CBT) at select centres in select cities. The duration of the examination is 3 hours.
3. MCQs carry 1 mark or 2 marks.
4. For a wrong answer in a 1-mark MCQ, 1/3 mark is deducted.
5. For a wrong answer in a 2-mark MCQ, 2/3 mark is deducted.
6. No negative marking for wrong answers in MSQ or NAT questions.

1. Consider two infinitely long fins made of the same material and exposed to the same convective environment. One fin has a square cross-section of side a, and the other has a circular cross-section of diameter d. Assume $a = d$. The ratio of the steady-state heat transfer rate from the square fin to that from the circular fin, $\frac{\dot{Q}_{\text{square}}}{\dot{Q}_{\text{circular}}}$, is:

(A) $\frac{\pi}{4}$
(B) $\frac{4}{\pi}$
(C) $\frac{2}{\sqrt{\pi}}$
(D) $\frac{\sqrt{\pi}}{2}$

---

2. A cantilever beam of length L is fixed at the left end ($x = 0$). It is subjected to a concentrated downward point load P and a concentrated clockwise moment $M = \frac{PL}{2}$ at the midpoint ($x = L/2$). Which of the following descriptions correctly represents the Shear Force Diagram (SFD) for the beam?

(A) A rectangular block of constant positive height P from $x = 0$ to $x = L/2$, and zero shear force from $x = L/2$ to $x = L$.
(B) A rectangular block of constant positive height P from $x = 0$ to $x = L/2$, followed by another rectangular block of height $P/2$ from $x = L/2$ to $x = L$.
(C) A triangular shape increasing linearly from $x = 0$ to $x = L/2$.
(D) A rectangular block from $x = 0$ to $x = L$, unaffected by the point load.

3. A vibrating system has a critical damping coefficient $C_c = 350\,\mathrm{N}\cdot\mathrm{s/m}$ and an actual damping coefficient $C = 35\,\mathrm{N}\cdot\mathrm{s/m}$. The logarithmic decrement of the system is approximately:

(A) 0.10
(B) 0.31
(C) 0.63
(D) 3.14

---

4. Two metal parts (a cylinder and a cube) of same volume are cast under identical conditions. The diameter of the cylinder is equal to its height. The ratio of the solidification time of the cube to that of the cylinder is _____ (rounded off to 2 decimal places).
Assume that solidification time follows Chvorinov's rule with an exponent of 2.

---

5. A plate of 30 mm thickness is fed through a rolling mill with two powered rolls. Each roll has a diameter of 500 mm. The plate thickness is to be reduced to 27 mm in a single pass. Assume no change in width. The process feasibility and the maximum draft (in mm) can be represented, respectively, as
Use the coefficient of friction as 0.12

(A) NOT feasible and 6.0
(B) NOT feasible and 2.6
(C) feasible and 3.6
(D) feasible and 3.0

---

6. The welding process commonly used for fabricating tailor-welded blanks of dissimilar thickness for automotive applications is

(A) arc welding
(B) laser welding
(C) gas welding
(D) friction welding

---

7. Let A and B be real symmetric matrices of same size. Which one of the following options is correct?

(A) $(AB)^T = B^T A^T$
(B) $AB = BA$
(C) $A^T = A^{-1}$
(D) $A = A^{-1}$
