

GATE 2025 Civil 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:

This question paper is divided into three sections:

1. The total duration of the examination is 3 hours. The question paper contains three sections -

Section A: General Aptitude

Section B: Engineering Mathematics

Section C: Subject Based Questions

2. The total number of questions is **65**, carrying a maximum of **100 marks**.

3. The marking scheme is as follows:

- (i) For 1-mark MCQs, $\frac{1}{3}$ mark will be deducted for every incorrect response.
- (ii) For 2-mark MCQs, $\frac{2}{3}$ mark will be deducted for every incorrect response.
- (iii) No negative marking for numerical answer type (NAT) questions.

4. No marks will be awarded for unanswered questions.

5. Follow the instructions provided during the exam for submitting your answers.

(1) Given the following staff readings at two levels, determine the Reduced Level (RL) of B.

Level	Reading A	Reading B
A	1.80	1.35
B	1.45	0.95

Given: - RL of A = 150 m - Find RL of B

- (A) 150.35 m
 - (B) 149.90 m
 - (C) 151.25 m
 - (D) 148.50 m
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(2) Given the bearing N30°W, determine the corresponding Whole Circle Bearing (WCB).

Bearing	WCB
N30°W	330°

Given: - Bearing = N30°W - Find WCB

- (A) 330°
 - (B) 150°
 - (C) 90°
 - (D) 180°
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(3) Given the following data, determine the final water content W_2 :

Parameter	Value
W_1 (initial water content)	18%
G_p (specific gravity)	2.74
S_1 (degree of saturation)	0.65
S_2 (new degree of saturation)	0.852
W_2 (final water content)	?

Given: - $W_1 = 18\%$ - $G_p = 2.74$ - $S_1 = 0.65$ - $S_2 = 0.852$ - Find W_2

- (A) 23.52%

- (B) 22.10%
- (C) 20.30%
- (D) 18.60%

(4) Given the following data for a hydraulic jump, determine the power loss (in kW):

Parameter	Value
B (width of the channel)	5 m
Q (discharge)	15 m ³ /sec
y_1 (initial depth)	0.5 m
g (acceleration due to gravity)	9.81 m/s ²
ρ_w (density of water)	1000 kg/m ³
α (coefficient of velocity)	1.0

Given: - $B = 5$ m - $Q = 15$ m³/sec - $y_1 = 0.5$ m - $g = 9.81$ m/s² - $\rho_w = 1000$ kg/m³ - $\alpha = 1.0$ -

Find Power loss in kW

- (A) 0 kW
- (B) 10 kW
- (C) 5 kW
- (D) 1 kW

(5) Given the following conditions, determine the value of the 15-minute Peak Hourly Factor (PHF):

Given: - Vehicles in the peak hour come in 10-minute intervals

- Find the value of the 15-minute PHF

- (A) 0.167
- (B) 0.25
- (C) 1 (Uniform)
- (D) 0.75

(6) Given the following data, determine the time T :

Given: - $n = 25$ years (Design life of the project)

- $\phi_1 = 5\%$ (Failure probability at year 25)

- Find T

- (A) 20 years
 - (B) 50 years
 - (C) 100 years
 - (D) 25 years
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(7) Bernoulli's theorem is applicable for which of the following conditions?

- (A) Steady
- (B) Incompressible
- (C) Rotational
- (D) Irrotational

Given:

- Bernoulli's theorem applies to steady, incompressible, inviscid, and irrotational flows, but not to rotational flows.
 - The flow should be steady, meaning the fluid properties at any given point do not change over time.
 - The fluid must be incompressible and inviscid (having no viscosity), and the flow should be irrotational, meaning there are no rotation effects in the flow field.
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(8) Which is the correct combination of velocity (V), length (L), and gravitational acceleration (g)?

- (A) $\frac{L}{V^2 g}$
- (B) $\frac{V^2}{g L}$
- (C) $\frac{V g}{L}$
- (D) $\frac{g L^2}{V}$

Given:

- Velocity (V) has dimensions of $[LT^{-1}]$.
 - Length (L) has dimensions of $[L]$.
 - Gravitational acceleration (g) has dimensions of $[LT^{-2}]$.
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(9) Analyze the given frame and determine the conditions that must be satisfied at joint

C and other members.

- (A) No rotation at joint C
- (B) Zero SF in member CD
- (C) AF is zero in D
- (D) BM dev. in BC at end C is more than 50 kNm

Given:

- The frame consists of a series of connected members with applied loads. - The joint at C has zero shear force in member CD, and no rotation is allowed at joint C. - The bending moment at various points is provided, and certain conditions must be satisfied at the ends and joints.

(10) Fill in the blank with the correct preposition:

Is there any good show ___ television tonight?

- (A) In
 - (B) On
 - (C) At
 - (D) Within
-

(11) Which of the following elements is typically removed during the aeration process of contaminated water?

- (1) Fe (Iron)
- (2) Mn (Manganese)
- (3) Cd (Cadmium)
- (4) Zinc