GATE 2026 Civil Engineering Question Paper

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

1. Consider a soil sample where the following parameters are defined:

- S = **Soil suction head**
- K = **Hydraulic conductivity**
- w = **Moisture content**

If the moisture content (w) of the soil increases, which of the following statements regarding the soil suction head (S) and hydraulic conductivity (K) is correct?

(A) Both S and K increase.
(B) Both S and K decrease.
(C) S increases while K decreases.
(D) S decreases while K increases.

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2. A clay deposit is found to have a natural water content and void ratio that corresponds to a pre-consolidation pressure (σ'_p) that is greater than the present effective overburden pressure (σ'_o). This clay is best classified as:

(A) OCC (Over Consolidated Clay)
(B) LCC (Lightly Consolidated Clay)
(C) NCC (Normally Consolidated Clay)

(D) Quick Clay

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3. For a two-lane, two-way highway, the length of a summit curve is ideally designed based on which parameter to ensure full operational efficiency (overtaking opportunities)?

(A) Lateral friction (f)
(B) Centrifugal acceleration (a_c)
(C) Stopping Sight Distance (SSD)
(D) Overtaking Sight Distance (OSD)

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4. In a rectangular open channel, a hydraulic jump occurs. The ratio of the post-jump depth (y_2) to the pre-jump depth (y_1) is measured to be 2. What is the Froude number (Fr_1) of the flow immediately before the jump?

(A) $\sqrt{2}$
(B) 1.5
(C) $\sqrt{3}$
(D) 2.5

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5. The Rational Method formula for estimating peak runoff is given as $Q = \frac{CiA}{360}$. For the result Q to be in cubic meters per second (m^3/s), what must be the units of rainfall intensity (i) and catchment area (A)?

(A) i in cm/hr, A in km^2
(B) i in mm/hr, A in km^2
(C) i in mm/hr, A in hectares
(D) i in m/hr, A in hectares

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6. Match the Gradually Varied Flow (GVF) profiles on a mild slope (M_1, M_2, M_3) with the nature of their water surface slope (dy/dx) relative to the flow direction. Select the correct classification:

Profile	Nature of Slope (dy/dx)
P. M_1 Profile	1. Positive (Rising Curve)
Q. M_2 Profile	2. Negative (Drawdown Curve)
R. M_3 Profile	3. Positive (Rising Curve)

(A) M_1 is Rising, M_2 is Rising, M_3 is Falling

(B) M_1 is Rising, M_2 is Falling, M_3 is Rising

(C) M_1 is Falling, M_2 is Rising, M_3 is Falling

(D) M_1 is Rising, M_2 is Falling, M_3 is Falling