

Total No. of Questions : 4]

SEAT No. :

PA-4956

[Total No. of Pages : 2

[6008]-201
S.E. (Civil) (Insem)
GEOTECHNICAL ENGINEERING
(2019 Pattern) (201008) (Semester - II)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4.*
- 2) *Figures to the right indicate full marks.*
- 3) *Neat figures must be drawn wherever necessary.*
- 4) *Assume suitable data if required.*
- 5) *Use of non programmable scientific calculator is allowed.*

- Q1)** a) Derive a relationship between void ratio, water content, Specific gravity and degree of saturation. **[5]**
- b) Explain "Core Cutter Method" to determine field density of soil with neat sketch. **[5]**
- c) Summarize the Major soil deposits in India. **[5]**

OR

- Q2)** a) Explain procedure of sieve analysis for the grain size distribution of soil. **[5]**
- b) Illustrate the Single, honeycomb, Flocculent and Dispersed structure of soil. **[5]**
- c) A soil sample has water content of 17% and bulk density of 16.40 kN/m^3 , determine the following : Void ratio, porosity, Degree of saturation and maximum dry density. ($G = 2.7$) **[5]**

- Q3)** a) List various laboratory tests for determination of coefficient of permeability and explain any one method in detail. **[5]**
- b) Determine the coefficient of permeability of a soil in cm/s, if soil sample 6 cm in height and 50 cm^2 in a cross - sectional area, and quantity of water equal to 430 ml passed down in 10 - minutes under an effective constant head of 40 cm. **[5]**

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- c) Determine the average coefficient of permeability in the horizontal and vertical directions for a deposit consisting of layers of 5m, 1m and 2.5m having the coefficients of permeability of 3×10^{-3} cm/sec, 2.8×10^{-4} cm/sec and 4.1×10^{-2} cm/sec respectively. [5]

OR

- Q4)** a) Explain various factors affecting Co-efficient of permeability. [5]
b) Explain Quicksand condition phenomenon and critical hydraulic gradient. [5]
c) Soil sample of 80 mm diameter with length of 300 mm used for constant head test. The loss of head 1100 mm and the rate of flow was $2700 \text{ mm}^3/\text{sec}$. Find the coefficient of permeability in mm/sec. If falling head test was performed on the same sample at the same void ratio, find the time taken for head to fall from 900 mm to 550 mm. The diameter of stand pipe is 25 mm in falling head test. [5]

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