

Total No. of Questions : 4]

SEAT No. :

**PF195**

[Total No. of Pages : 1

**Apr-26/SE/Insem-241**

**S.E. ( Civil Engineering) (Insem)**

**GEOTECHNICAL ENGINEERING**

**(2019 Pattern) (Semester - IV) (201008)**

*Time : 1 Hour]*

*[Max. Marks : 30*

*Instructions to the candidates:*

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

- Q1)** a) Starting from first principles derive the following equation with usual nomenclature:  $\gamma = [(G + e S_r) / (1+e)] \times \gamma_w$ . [5]
- b) Enlist the methods of soil exploration and explain any one in detail. [5]
- c) Define consistency of soils and show the four states of consistency graphically with appropriate consistency limits. [5]

OR

- Q2)** a) Write a note on major soil deposits of India. [5]
- b) The grading curve of soil gives the effective size as 0.15 mm  $D_{30} = 0.45$  mm and  $D_{60} = 0.75$  mm. Find  $C_u$  and  $C_c$  and also classify the soil. [5]
- c) State the methods for determination of field density. Explain the step by step procedure for any one of the methods with neat sketch. [5]

- Q3)** a) Explain falling head permeability test for determination of coefficient of permeability. [5]
- b) For weir on permeable foundation, the exit gradient does not exceed 78% of the grading causing quick condition. Determine maximum exit gradient if porosity is 35%. [5]
- c) Write short note on permeability of stratified soil deposits. [5]

OR

- Q4)** a) Write short note on Piping. [5]
- b) Explain various factors affecting coefficient of permeability. [5]
- c) Flow is taking place from the upstream of the dam under the head difference of 10 m. From the flow net it was found that the numbers of flow channels are 5 and the equipotential drops are 15. If the permeability of the soil is  $4 \times 10^{-4}$  m/min then what will be the quantity of flow per hour per meter length of the dam. [5]

