

“Please check whether you have got the right question paper.”

- N.B**
- i) Solve any three questions from section A and section B. each section.
  - ii) Assume suitable data if necessary.
- SECTION-A**
- Q.1 a) Derive poiseuille’s law of flow through capillary tube. 08  
b) Explain logarithm of time fitting method. 08
- Q.2 a) Derive terzaghi’s differential equation for one-dimensional consolidation. 08  
b) A soil sample of height 6cm and area of cross section of 100cm<sup>2</sup> was subjected to falling head permeability test. In a time interval of four minutes, the head dropped from 65cm to 25cm. if the cross sectional area of the stand pipe is 1.5cm<sup>2</sup>, compute the coefficient of permeability of soil sample. 08
- Q.3 a) Explain with the help figure “Textural Classification” of a soil. 08  
b) Explain permeability of stratified soil deposits with a neat sketch. 08
- Q.4 a) Prove that  $e = \frac{\omega G}{Sr}$  08  
Where e, w, G, Sr are the void ratio, water content, specific gravity and degree of saturation of soil mass.  
b) Differentiate between ‘Standard Procter test’ and ‘Modified Procter Test’ with the help of at least six points in tabular form. 08
- Q.5 Write short notes on 18  
a) Thixotropy of clays  
b) Falling head permeability test  
c) Core cutter method of determination of field density.
- SECTION -B**
- Q.6 a) Explain the procedure of determination of unconfined compressive strength of soil mass of clayey soil. 08  
b) A vane, 10CM long and 8CM in diameter, was pressed into soft clay at the bottom of bore hole. Torque was applied and gradually increased to 45N-M when failure will take place. Calculate the cohesion of the clay in the natural state and also the value of sensitivity. 08
- Q.7 a) Explain ‘Mohr-coulomb’ failure theory with the help of figure and equation. 08  
b) Derive the expression for total vertical pressure under a uniformly loaded circular area. 08
- Q.8 a) Explain stability of down-stream slope of earth dam during steady seepage. 08  
b) Explain “Swedish –circle method” of stability analysis. 08
- Q.9 a) How will you determine active earth pressure using Rankine’s theory for dry or moist backfill with no surcharge? 08  
b) Explain active earth pressure of cohesive soil. 08
- Q.10 Write short notes on 18  
a) Taylor’s stability number b) Types slope failure c) Boussinesq’s equation for point load.