

SUBJECT CODE:- K-71
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(Civil) Examination Nov/Dec 2015
Geotechnical Engineering
(Revised)

[Time: Three Hours]

[Max. Marks: 80]

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

N.B i) Q.No.1 and Q.No.6 are compulsory.

ii) Solve any two questions from remaining from section A and section B.

iii) Assume suitable data, if necessary.

Section-A

- Q.1 Write short notes on:
- i) Square root of time fitting method 06
 - ii) Field compaction methods 06
 - iii) Laboratory consolidation test 04
- Q.2 A Explain pipette method used for sedimentation analysis. 06
 B A compacted sample of soil with a bulk unit weight of 19.62 kN/m^3 has a water content of 15%. What are its density, degree of saturation and air content? Assume $G=2.65$. 06
- Q.3 A Prove that :- $\rho = \frac{(G+e su) \gamma_w}{1+e}$ 06
 Where γ , G , e , S_u & γ_w are bulk density specific gravity, void ratio, degree of saturation & density of water.
 B Explain sand- replacement method used for determination of in situ density. 06
- Q.4 A Explain with the help of figure plasticity chart. 06
 B Discuss the application of geotechnical engineering in civil engineering construction sector. 06
- Q.5 A Explain the procedure of determination of maximum dry density and optimum moisture content by standard Proctor test. 06
 B A laboratory composition test was conducted on soil. The observations are : 06
 i) $MDD=18.5 \text{ kN/m}^3$. ii) $G=2.67$
 iii) Water content 18%. Determine the degree of saturation, air content and percentage of air voids at MDD. What is the theoretical MDD at OMC corresponding to zero air voids.

Section-B

- Q.6 Write short notes on:-
- i) Earth pressure at rest 04
 - ii) Vane shear test 06
 - iii) Swedish circle method 06
- Q.7 A Explain “Equivalent point load method” of finding vertical stress at any point. 06
 B Explain Coulomb’s wedge theory for earth pressure. 06
- Q.8 A Differentiate between finite and infinite slopes. 06
 B Derive the equation for active pressure assuming back fill as dry. Sketch a pressure distribution diagram. 06
- Q.9 A Explain friction circle method of stability analysis. 06
 B A cylinder of soil fails under an axial vertical stress of 160 kN/m^2 , when it is laterally unconfined. The failure plane makes an angle of 50° with the horizontal. Calculate the values of cohesion and angle of internal friction of soil. 06

- Q.10A Explain the procedure of determination of shear strength parameters of soil by direct shear test.
- B Explain the construction & use of new mark influence chart.

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