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**B.Tech. Civil (Construction Management) /
B.Tech. Civil (Water Resources Engineering)****Term-End Examination****December, 2013****ET-501(B) : FOUNDATION ENGINEERING***Time : 3 hours**Maximum Marks : 70*

*Note : Attempt all questions. Use of calculator is permitted.
Assume reasonable values for missing data, if any.
Illustrate your answer with neat sketches.*

1. Answer *any four* of the following : **4x10=40**
- (a) In what conditions will you suggest Geophysical methods of exploration ? Discuss about following geophysical methods.
- (i) Electrical resistivity
- (ii) Seismic method
- (b) Define Bearing Capacity. Explain different types of shear failures with neat sketches. Explain the salient features to distinguish between them.
- (c) A strip foundation of width 2.5 m is to be founded at a depth of 1.5 m in a well drained sand stratum, having the following properties. $\phi' = 38^\circ$, $\gamma = 18 \text{ kN/m}^3$. Determine the ultimate bearing capacity using terzaghi's Bearing Capacity equation. Take $N_q = 65.34$ and $N_r = 77.2$.

- (d) Design a plain concrete wall footing to support a 300 mm thick block masonry wall. Dead load including self weight of the wall is 150 kN/m and the live load is 300 kN/m. The allowable bearing capacity of the soil is 250 kPa. The weight of the earth is 16.8 kN/m^3 . The footing is to be placed 1.20m below GL. Assume M_{20} grade of concrete.
- (e) Derive an expression for immediate settlement due to a point load and uniformly loaded flexible area, from theory of elasticity.
- (f) Write short notes on :
- (i) Raft foundations
 - (ii) Causes of settlements

2. Answer *any three* of the following : **3x10=30**

- (a) A retaining wall with vertical face on backfill side is 3m high. The backfill is being loaded with a uniform surcharge of 30kPa. The properties of soil are given as ; $\phi = 30^\circ$, $C = 0$; $\gamma = 16 \text{ kN/m}^3$. Calculate the magnitude and point of application of total active earth pressure acting on the retaining wall.
- (b) Explain different types of deep foundations, with neat sketches.
- (c) Describe classification of pile foundations.
- (d) Derive an expression for amplitude due to sliding vibration.
- (e) Explain different types of well foundations, with their relative merits and demerits.
