Code No: **RT42013A** **R13** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April/May - 2019

ADVANCED FOUNDATION ENGINEERING

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

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PART–A *(22 Marks)*

1. a) What are the factors influencing the bearing capacity of a foundation? [3]
   b) What is the difference between immediate settlement and primary consolidation settlement? [4]
   c) What are different types of isolated footing and its merits? [3]
   d) What are the main elements present in the design of anchors? [4]
   e) What are the various approaches used to estimate the load carrying capacity of a pile groups? [4]
   f) What are the basic approaches used to reduce or prevent the effect of swelling on structures? [4]

PART–B *(3x16 = 48 Marks)*

2. a) How does Hansen's method is differ from Vesic's method? [8]
   b) A square footing 2.5 × 2.5 m size has been founded at 1.2 m below the G.L in a cohesive soil having a bulk density of 1.8 t/m^3 and unconfined compressive strength of 5.5 t/m^2. Determine the ultimate and safe bearing capacity of the footing for a factor of safety 2.5, $\phi = 28^0$. [8]

3. Explain the following in detail about
   (a) De Beer and Marten's method (b) Janbu's method [16]

4. Describe various methods for design of mat foundations. What are their relative merits? [16]

5. a) Distinguish between fixed and free earth support methods. [8]
   b) A cantilever sheet pile wall retains cohesion less soil for a height of 6.5m. The water table is at a depth of 4.5m below the top of the wall $\phi = 35^0$, Υ=19 kN/m^3, Υ_{sat}= 22 kN/m^3, determined depth of embedment for the sheet pile. [8]

6. Explain how settlement of piles is estimated in (a) sands (b) clays. [16]

7. a) What are the under reamed piles? Under what conditions they are suitable and what are the limitations of under reamed piles. [8]
   b) Briefly explain various problems associated with expansive soils in civil engineering. [8]