Total No. of Questions : 6]

P4955

SEAT No. :

[**Total No. of Pages :3**

[4960]-40

M.E.(Civil)(Structures)
DESIGN OF FOUNDATIONS
(2008 Pattern)(Semester-I)(Elective-I)

Time :4Hours]　　　　　　　　　　　　　　　　　　　　　　*[Max. Marks : 100*

Instructions to the candidates:

1) Answer any two questions from each section.

2) Answers to the two sections should be written in separate books.

3) Neat diagrams must be drawn wherever necessary.

4) Your answers will be valued as a whole.

5) Use of logarithmic tables electronic pocket calculator is allowed & IS codes are not allowed.

6) Assume suitable data, if necessary.

SECTION-I

Q1) a) Explain the following　　　　　　　　　　　　　　　　　**[15]**

　　i)　Proportioning of footing.

　　ii)　IS - 1892, provisions for soil Exploration.

　　iii)　A - line chart.

　　iv)　Teng's correlations.

　　v)　Soil structure Interaction

　b)　Explain the steps by sample calculations, for computation of consolidation settlement, for a framed structure, column footing with a pressure increment of 160 kN/m^2, size 2.5m×3.5m. Assume, two layers of soil, sand & clay with following properties,　**[10]**

　　i)　For sand, $\gamma = 19$ kN/m^3 & $\gamma_{sat} = 22$ kN/m^3

　　ii)　For clay, $\gamma_{sat} = 18$ kN/m^2, C_c=0.30, W =40% & G = 2.7

　Consider effect of GWT.

Q2) a) Explain the design steps, with sample calculations for, **[16]**

      i)   Flat slab Raft

      ii)   Beam & Raft (slab) foundation

  b) Discuss the conditions favouring the design of diff. types of raft foundations. **[9]**

Q3) a) Compare in the light of IS-2974-Pt-II-1966, design of foundations for, **[15]**

      i)   Rotary machines

      ii)   Impact machines

  b) A machine having a wt. of 25,000 kN has an unbalance, such that it's subjected to a force of 6000 kN at a frequency of 650 rpm. What should be the 'K' for the supporting springs if the max force transmitted to the foundation, due to the machine is 600 kN? Neglect damping. **[10]**

SECTION-II

Q4) a) Explain the following **[15]**

      i)   Design steps for precast & cast-in-situ piles.

      ii)   Converse La-barre's formula & Feld's rule.

      iii) PSF & NSF

  b) Compute the settlement of pile group to carry a load of 4000kN, for a 20m deep clay. Width of pile cap is 6m, length of pile 15 m with 0.6 M, ϕ. The q_u=90 kN/m²,clay is underlain by rock. Assume 30°, pressure distribution. **[10]**

    LL is 80% & FOS for shear is 03.

Q5) a) Explain the steps for 'Rees & Matlock' method. **[10]**

  b) Design an RCC precast pile to sustain a working load of 900 kN, with length 12m & ϕ = 0.4 M. q_u = 50kN/m². Design with suitable reinforcement & check for handling stresses. **[15]**

Q6) a) Explain the steps for 'Design of pile cap', with the help of sample calculations. **[9]**

b) Describe diff. types of 'shell foundations', stating their suitability & IS code recommendations. **[8]**

c) Compare 'Hyperbolic & Conical RC shell foundations' with & without edge-beams. **[8]**

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