Sanjay Ghodawat University, Kolhapur   2018-19

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017   EXM/P/09/01

Year and Program: **2018-19**   School of Technology   **Department of Civil Engineering**
(M. Tech. Construction
Engineering & Management)

Course Code: **CSE5083**   **Course Title:** Design of Foundations   **Semester – I**

Day and Date ꓠꓳꓠꓒꓮꓬ   **End Semester Examination (ESE)**   Time: Max Marks: **100**
27-05-2019   2.30 to 5.30 pm.

Instructions: 1) All question are compulsory.
2) Assume suitable data wherever necessary.

Q.1   A square footing has to transfer a dead load of 900 kN and an imposed   25   L5   CSE5083.1
load of 500 kN for a square column of size 450 mm. Assume the safe
bearing capacity of the soil as 200 kN / m^2. Design a square footing to
support the above column. Adopt M20 grade concrete and Fe 415
grade steel.

OR

A building consists of 12 columns 400×400mm in sizes arranged in   25   L5   CSE5083.2
three rows of four each. Distance between the columns is 5m each.
The load carried by four corner column is 500 kN each, that carried by
exterior column is 700 kN each and that carried by interior column is
900 kN. Allowable soil pressure is 90 kN / m^2. Design the raft slab.
Use M 25 grade concrete and Fe 415 grade steel.

Q.2   Describe how vibration isolation of machine foundation is done?   25   L4   CSE5083.3
Assuming resonance to have occurred at a frequency of 30 cycles/sec
in a vertical vibration of a test block 1m x 1m x 1m. Determine the
value of Cu. The weight of the oscillator is 800 Newton and force
produced by it after 15cycles is 1500 N. Compute the max. amplitude
in the vertical direction at 15 cycles/sec. Weight of test block is 24
kN/m^3.

OR

A column 450×450 mm in section stands on a pile cap supported on   25   L4   CSE5083.4
three piles. The column is situated centroid of the pile group. The load
transfer on column is 1000 kN, is supported on three piles 450 mm

ESE

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Ø in section. The center to center distance between the piles is 1.5 m. Design a suitable pile cap. Use M20 concrete and Fe 415 steel.

Q.3 a Explain in detail with neat sketch the various elements well foundation? Enlist advantages of well foundation?   10 L₂ CSE5083.5

b A cylindrical well of external diameter 8m and internal diameter 5m is sunk to a depth of 18m below the maximum scours level in sand deposits. The well is subjected to a horizontal force of 1500 kN acting at height of 10m above the scour level. Determine the lateral allowable equivalent resisting force due to earth pressure, assuming that the wall rotates about a point above the base. Assume $\gamma_{Sub} = 10.5$ kN/m³, Ø = 28° F. O. S= 2. Use Terzahi's Approach.   15 L₄ CSE5083.5

Q.4 a What different causes foundation failure?   10 L₂ CSE5083.6

b Explain in details any one case study of shallow foundation failure?   15 L₃ CSE5083.6

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