COLLEGE OF ENGINEERING PUNE

(Formerly Government College of Engineering, Pune)

END SEMESTER EXAMINATION April 2013

(CE 410) Construction Techniques and Machinery

Program: Final Year B.Tech.(Civil)
Date: 25.04.2013
Max. Marks: 50

Year:2012-13; Semester II
Duration: 03hrs (02 to 05 PM)
Venues – AC 101,102 & 103

Instructions:

1. **All questions are compulsory.**
2. **Figures to right indicate full marks.**
3. **Draw neat figures/sketches wherever necessary.**
4. **Mobile phones and Programmable Calculators are not permitted.**

Q 1 A) XYZ Builder is planning to acquire machine for a company. One out of following three alternatives is to be chosen.

(i) Purchase the machine for Rs 575000/- each and sell after 6 years for an estimated 75000/- each.

(ii) Lease the machine for 6 years for Rs 150000/- per year in advance at the beginning of each year. The user pays all O&M costs and the leasing company retains ownership.

(iii) Purchase the machine on special time payments with Rs 100000/- down payment and Rs 125000/- per year at the end of each year for 5 years. Assume the machine will be sold after 6 years for Rs 50000/- each.

If the contractor's Minimum Attractive Rate of Returns (MARR) is 10%, which alternative should be used? (03)

B) Describe the techniques and machinery adopted for a soil compaction with reference to (i) type of soil, (ii) volume of embankment and (iii) compaction effort. (04)

Explain step by step procedure of embankment construction with compaction specification. (03)

Q 2 A) Explain procedure of asphalt concreting with description of machineries used. (03)

B) Describe cofferdam with reference to (i) purpose, (ii) types with criteria for adoptability and (iii) construction procedure (03)

C) Explain dewatering process with reference to following points,
(i) basic purposes, (ii) field conditions, (iii) prediction of pumping rates
(iv) method adopted. (04)

Q 3 A) Explain in detail the techniques of underwater concreting. (02)

Also explain (i) Direct Mud Circulation, (ii) Reverse Mud Circulation and (iii) Air Lift Flushing techniques. (06)

B) Describe Gabian Wall techniques. (02)

Q 4 A) What is retrofitting of bridges? Why is it needed? How is it executed? What are the precautions to be observed? (04)

B) Describe in detail with neat sketches the various techniques of launching of bridge P.S. girders with reference to
(i) selection criteria, (ii) procedure and (iii) precautions (06)

Q 5 A) Explain in detail the reinforcement applications of geosynthetics. (02)

B) Describe various crushers used in aggregate production process. (04)

C) Write notes on ANY TWO of the following (04)

(i) TBM

(ii) Grouting

(iii) Natural Geosynthetics and its applications

(iv) Dragline and Clamshell

----------Paper Ends----------