Code No. 2282

FACULTY OF ENGINEERING

B.E. 4/4 (CE) II – Semester (Main) Examination, April / May 2013

Subject: Advanced Reinforced Concrete Design (Elective – II)

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1. How does the design of a curved beam differ from the design of a straight beam? (2)
2. A circular beam supported on six equally spaced columns on a 10 m diameter curve carries an all inclusive u.d.l. of 20 kN/m. Draw the SFD and BMD. (3)
3. Sketch the reinforcement details at the junction of a beam and column at an intermediate floor. (2)
4. List the IS codal provisions for the design of deep beam. (3)
5. Give two examples where portal frames are provided in construction industry. (2)
6. Draw a substitute frame indicating the loading position for maximum positive negative BM at mid span of a beam. (3)
7. Differentiate between flat slab and ordinary slab with respect to placement of reinforcement. (2)
8. List the assumptions made in equivalent frame method for analysis of flat slabs. (3)
9. What is a raft foundation? When these foundations are provided? (2)
10. Sketch the reinforcement details in a typical raft foundation. (3)

PART – B (5x10 = 50 Marks)

11. Design and detail a circular curved beam for a water tank supported on four equally spaced columns on a 5 m diameter curve subjected to a u.d.l. of 14 kN/m. Use M25 grade concrete and Fe 550 grade steel. Use of SF, BM and TM coefficients table is permitted. (10)

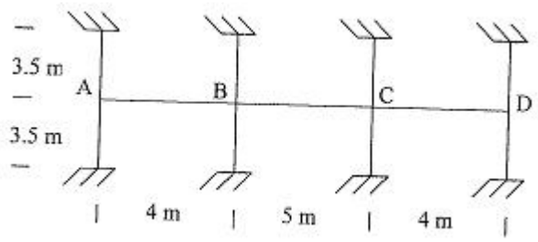
12. Design and detail a simply supported deep beam using the following data:
    Span of beam = 5 m
    Overall depth = 4 m
    Width of support = 0.5 m
    Width of beam = 0.6 m
    u.d.l. (including self weight) = 300 kN/m
    Use M20 grade concrete and Fe 415 grade steel. (10)

13. A reinforced concrete portal frame, hinged at its bases, is of span 12 m and height 7 m. The frame carries an all inclusive u.d.l. of 20 kN/m. Design the columns for the frame. Use M25 grade concrete and Fe 500 grade steel. Sketch neatly the reinforcement details. (10)

14. A reinforced concrete portal frame, hinged at its bases, is of span 10 m and height 6 m. The frame carries an all inclusive u.d.l. of 26 kN/m. Design the slab and footing including the hinge at base for the frame. Use M25 grade concrete and Fe 415 grade steel. Sketch neatly the reinforcement details. (10)

…2.

15. The substitute frame at a typical floor level of a multi-storied building frame is shown below. Calculate the maximum support moment at B. Take DL = 15 kN/m and LL = 30 kN/m. Assume moment of inertia of all columns = 2I, beams AB and CD = 2I and beam BC=3I. (10)



16. Design the interior panel of a flat slab for a column grid of 7 m x 7 m for a hotel building and to carry a live load of 5 kN/m^2. Use M30 grade concrete and Fe 500 grade steel. Sketch neatly the reinforcement details. (10)

17. A building plan consists of four columns arranged in two rows and spaced 4 m c/c in both directions. The columns carry a service load of 1200 kN each. Design and detail a suitable raft foundation for the building. The S.B.C. of soil is 150 kN/m^3. Use M35 grade concrete and Fe 550 grade steel. (10)

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Code No. 2281

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) II-Semester (Main) Examination, April / May 2013

Subject : Advanced Environmental Engineering
(Elective - II)

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Define equalization and Neutralization. (2)
2. Write the effects of Industrial effluents on human health. (2)
3. Write the basic stages in manufacturing process of tanning industry. (3)
4. What are the characteristics of waste water in sugar mills? (2)
5. Write about the factors to be considered for rehabilitation of affected people. (2)
6. List out meteorological factors influencing air pollution. (2)
7. What are disadvantages of scrubbers? (3)
8. Draw the figure of gravitational settling chambers. (3)
9. Write the methods of EIA. (3)
10. What is maximum mixing depth? (3)

PART – B (5x10=50 Marks)

11.(a) Explain in detail about streeter phelps equation.
(b) Explain different processes involved in the treatment of Industrial wastes.

12.(a) Explain the manufacturing process in a dairy industry and treatment of dairy waste.
(b) Explain the process of treatment of coke oven waste, blast furnace waste and scale-pit effluent in a steel plant.

13.(a) Describe the method of analysis of suspended particulate matter.
(b) Classify air pollutants into different categories, indicating their sources.

14.(a) Describe cyclone scrubber and spray towers with a neat sketch.
(b) With sketch, explain the principle of condensation for gaseous pollutants control.

15.(a) What are the basic factors to which EIA should address?
(b) State the limitations of EIA.

16.(a) Explain about self purification of rivers.
(b) Brief out the objectives of Environmental Management plan.

17. Write short notes on the following:
(a) Stack height calculation
(b) Preparation of EIA for a dam

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Code No. 2280

FACULTY OF ENGINEERING

B.E. 4/4 (CE) II-Semester (Main) Examination, April / May 2013

Subject : Ground Improvement Techniques
(Elective - II)

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. In cohesionless soils, in general, the dynamic methods of ground improvement are more effective than static methods. Answer yes or no and justify your answer.
2. "In cement stabilization method, the quantity of cement by weight required for clays is around 5% and that for gravels is around 20%". Answer yes or no and justify your answer.
3. State the empirical equation for calculation of quantity of charge in blasting method of ground improvement.
4. "the pre-fabricated vertical drains are installed by drilling a bore hole". Answer yes or no and justify your answer.
5. Name the ideal geosynthetic product of ruse in canal lining works.
6. What is "Volatile content" in bitumen? What is its effect in bituminous stabilization?
7. What is "blanket grouting" ? Why and where it is used?
8. The suitability number of an earth selected as back fill material in vibro-floatation method is found to be 16.80. Determine its effective size, if D_{20}=0.60mm and D_{50}=1.20mm.
9. Applying Carillo's solution for the differential equation governing consolidation process aided with vertical drains, determine the overall degree of consolidation (U) if degree of consolidation due to vertical drainage and radial drainage are 26% and 68% respectively.
10. State the application of geosynthetics as capping in solid waste disposal sites.

PART – B (5x10=50 Marks)

11.(a) Explain classification of ground condition based on the potential for ground improvement with suitable examples. (5)
(b) In Himalayan region, the road connectivity is seriously affected by landslide. Identify the geotechical challenges involved in such ground conditions, identify possible ground improvement techniques and suggest the ideal techniques. (5)

12.(a) Describe the soil stabilization procedure in detail. (5)
(b) Critically compare the Cement and Bitumen methods of stabilization including the functions served by each, the merits and demerits and suitability. (5)

13.(a) Explain the mechanism of compaction piles in densifying the ground. Give details of their construction procedure. (5)
(b) Write a detailed note on "sand compaction piles". (5)

14.(a) Explain the concept of "pre-compression". Describe briefly various pre-compression methods and their suitability. (5)
(b) Compare conventional sand drains with pre-fabricated vertical drains. (5)

15.(a) Write a detailed note on "classification of geosynthetics" including salient features of each type. Also state briefly, the functions served and the associated applications. (5)
(b) Draw typical cross section of a Reinforced soil wall and name the parts. (5)

16.(a) Explain the grout procedure in detail. (5)
(b) Describe the applications of grouting in improvement of bearing capacity. (5)

17. Write short notes on any two of the following: (10)
(a) Objectives of ground improvement
(b) Lime stabilization
(c) Dewatering methods in ground improvement
(d) Applications of geosynthetics in erosion control

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