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B.E. DEGREE EXAMINATION, 2015

(CIVIL ENGINEERING)

(EIGHTH SEMESTER)

CLEC-801 . PRE-STRESSED CONCRETE

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for those joined before 2010-11 batch)

Answer any ONE FULL question from each unit.

EACH question carries FIFTEEN marks.

UNIT – I

1. The concrete beam of rectangular cross-section of size 300 mm × 500 mm is pre-stressed with 750 kN at an eccentricity of 100 mm from the centre of gravity of the cross section with 500 mm^2 of pre-stressing steel stressed to 1500 N/mm^2. Analyze the section for stresses.

(OR)

2. Describe fully the Freyssinet system of pre-stressing with the help of neat sketches.

UNIT – II

3. The cross-section of a symmetrical I-section pre-stressed beam is 300 mm by 750 mm (overall), with flanges and web 100 mm thick. The beam is post-tensioned by cables containing 48 wires of 5 mm diameter high-tensile steel wires at an eccentricity of 250 mm. The 28 day strength of concrete in compression is 40 N/mm^2 and the ultimate tensile strength of wires is 1700 N/mm^2. Assuming that the grouting of the tendon is 100% effective, determine the ultimate moment of the section.

(OR)

4. The end block of a pre-stressed concrete beam, 100 mm wide and 200 mm deep, suppports an eccentric pre-stressing force of 100 kN, the line of action of which concides with the bottom kern of the section. The depth of the anchor plate is 50 mm. Estimate the magnitude and position of the principal tensile stress on a horizontal plane passing through the centre of the anchorage plate.

UNIT – III

5. Design a pre-cast pre-stressed inverted T-section to be used in a composite slab of total depth 600 mm and width 300 mm. The composite slab is required to support an imposed load of 16 kN/m^2 over a span of 14 m. The compressive stress in concrete at transfer and the tensile stress under working loads may be assumed to be 20 and 1 N/mm^2. The loss ratio is 0·85. Determine the pre-stressing force required for the section. Load due to self-weight of the pre-cast beam and *in-situ* concrete.

(OR)

6. A composite bridge deck is made up of an *in-situ* cast slab 120 mm thick and symmetrical I-sections of pre-cast pre-tensioned beams having flange width and thickness of 200 mm and 110 mm respectively.

   Thickness of web = 75 mm. Overall depth of I-section = 500 mm.

   Spacing of I-beams = 750 mm centres.

   The modulus of elasticity of *in-situ* slab concrete is 30 kN/mm^2.

   Estimate the stresses developed in the composite member due to a differential shrinkage of 100×10^{-6} between the pre-cast and cast *in-situ* elements.

UNIT – IV

7 A continuous pre-stressed concrete beam ABC (AB = BC = 10 m) has a uniform rectangular cross-section with a width of 100 mm and depth of 300 mm. The cable carrying an effective pre-stressing force of 360 kN is parallel to the axis of beam and located at 100 mm from sofit.

   (a) Determine the secondary and resultant moment at the central support B.

   (b) If the beam supports an imposed load of 1·5 kN, calculate the resultant stresses at top and bottom of the beam at B. Assume density of concrete is 24 kN/m^3.

   (c) Locate the resultant line of thrust through beam AB.

(OR)

8. Explain the layout of cables.

UNIT – V

9. Design a non-cylinder pre-stressed concrete pipe of internal diameter 500 mm to withstand a working pressure of 1 N/mm^2. High tensile wires of 2 mm diameter stressed to 1200 N/mm^2 at transfer are available for use. Permissible maximum and minimum stresses in concrete at transfer and working loads are 13·5 and 0·8 N/mm^2(compression) respectively. Loss ratio = 0·8, E_s = 210 kN/mm^2 and E_c = 35 kN/mm^2. Calculate :

(a) The minimum thickness of concrete for the pipe.

(b) Number of turns of wire per metre length of pipe.

(c) The test pressure required to produce a tensile stress of 0·7 N/mm^2 in the concrete when applied immediately after tensioning and

(d) The winding stress in the steel.

(OR)

10. Design a cylindrical pre-stressed concrete water tank to suit the following data :

Capacity of the tank = $3{\cdot}5 \times 10^6$ litres. Ratio of diameter to height = 4.

Maximum compressive stress in concrete at transfer not exceed 14 N/mm^2.

Mimimum compressive stress under working load to be 1 N/mm^2.

The pre-stress is to be provided by circumferential winding of 5 mm wires and by vertical cables of 12 wires of 7 mm diameter.

The stress in wires at transfer = 1000 N/mm^2. Loss ratio = 0·75.

Design the walls of the tank and the details of the circumferential wire winding and vertical cables for the following joint conditions at the base:

(a) Hinged. (b) Fixed and (c) Sliding base.

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B.E. DEGREE EXAMINATION, 2015

(CIVIL AND STRUCTURAL ENGINEERING)

(EIGHTH SEMESTER)

CSEC-802 / PCSEC-701. PRE-STRESSED CONCRETE

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for those joined before 2011-12)

Answer any ONE FULL question from each unit.

Use of IS 1343 is permitted.

ALL questions carry EQUAL marks.

UNIT – I

1. (a) Distinguish between pre-stressed concrete and reinforced concrete.

   (b) Explain the various types of pre-stressing systems based on wedge action.

(OR)

2. (a) Explain why high strength concrete and high tensile steel are used for Pre-Stressed Concrete construction.

   (b) Describe the various losses in pre-stress. Indicate their order of magnitude.

UNIT - II

3. (a) What are the fundamental conditions for stresses at transfer and service loads in the design of Pre-Stressed Concrete sections?

   (b) A pre-tensioned Pre-Stressed Concrete beam having a rectangular section 120 mm wide and 320 mm deep has an effective cover of 40 mm. If f_{ck} = 40 N/mm^2, f_p = 1600 N/mm^2 and area of pre-stressing steel A_p = 460 mm^2, calculate the ultimate flexural strength of the section using IS code procedure.

(OR)

4. (a) Explain the Hoyer effect on the phenomenon of bond in pre-tensioned beam.

   (b) The end block of a Pre-Stressed Concrete girder is 200 mm wide and 300 mm deep. The beam is post-tensioned by two Freyssinet anchorages each of 100 mm diameters with their centres located at 75 mm from the top and bottom of the beam. The force transmitted by each anchorage being 2000 kN. Compute the bursting force and design suitable reinforcements according to IS code provisions.

UNIT - III

5. (a) Briefly outline the necessity of using composite section in Pre-Stressed Concrete structures.

   (b) Discuss about the shear in composite beams. What are the provisions usually made to counteract the effects?

(OR)

6. (a) Distinguish between propped and unpropped construction methods in composite construction using stress diagrams at various stages of construction.

   (b) Specify the various steps involved in the design of composite sections.

UNIT - IV

7. (a) What are the advantages of pre-stressing in the design of members subjected to axial tension?

   (b) What are load moment interaction diagrams in columns? Explain with sketches, the different types encountered in column subjected to compression and bending.

(OR)

8. (a) What are the advantages of concrete poles? Explain with sketches, the different types of cross sections generally used for poles.

   (b) Mention the types of Pre-Stressed Concrete sleepers and their design considerations.

UNIT - V

9. (a) List the factors which influencing the deflection of Pre-Stressed Concrete members.

   (b) Discuss the effect of tendon profiles on deflection of Pre-Stressed Concrete members.

(OR)

10. (a) What is meant by partial pre-stressing? Discuss the advantages and disadvantages when partial pre-stressing is done.

    (b) How do you compute the width of cracks at the critical sections in partially pre-stressed concrete beams?

Name of the Candidate :

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B.E. DEGREE EXAMINATION, 2015

(CIVIL ENGINEERING)

(EIGHTH SEMESTER)

CLEC-803. INTERIOR DECORATION AND PLANNING

[Time : 3 Hours

May]

Maximum : 75 Marks

(Maximum 60 Marks for those joined before 2011-12)

Answer any ONE FULL question from each unit.
ALL questions carry EQUAL marks.

UNIT – I

1. Explain with sketch of the following : (8+7)
   (a) Standard size of furniture. (b) Standard size of fixtures.

(OR)

2. List out the "forms of presentations". Explain any one in detail. (15)

UNIT – II

3. Write short notes on the following : (8+7)
   (a) Anthropometrics. (b) Ergonomics.

(OR)

4. Briefly outline the following : (8+7)
   (a) Importance of furniture. (b) Maintenance of furniture.

UNIT – III

5. List out types of bathrooms. Explain any two in detail. (15)

(OR)

6. What are all the basic requirements of a residential kitchen? Also, describe the design guidelines. (15)

UNIT – IV

7. Discriminate between partitions and pannelling. Also, explain its applications. (15)

(OR)

8. Write short notes on following :
   (a) Requirements of a good ceiling material. (8)
   (b) Requirements of a good stair. (7)

UNIT – V

9. Briefly explain the historical background and principles of landscaping. (15)

(OR)

10. Differentiate in detail about exterior landscaping and interior landscaping. (15)

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B.E. DEGREE EXAMINATION, 2015

(COMMON TO ALL BRANCHES)

(EIGHTH SEMESTER)

CLEC-804. ETHICS IN ENGINEERING

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for those joined before 2011-12)

Answer any ONE FULL question from each unit.
ALL questions carry EQUAL marks.

UNIT – I

1. (a) State the need for engineering ethics. (5)
   (b) List the types of inquiry. (5)
   (c) Justify sense of responsibility. (5)

(OR)

2. Explain in detail relating to professisonal and ordinary morality. (15)

UNIT – II

3. (a) Discuss the contracts with standard experiments. (8)
   (b) Justify engineering as responsible experimenters. (7)

(OR)

4. (a) Explain in detail the uncertainities in design and testing for safety. (10)
   (b) What are the incentives to reduce risk? (5)

UNIT – III

5. (a) Discuss in detail misguided loyalty. (8)
   (b) Explain the need for faithful agent argument. (7)

(OR)

6. (a) Discuss the need for interests in other companies. (8)
   (b) Write a short note on endangering lives. (7)

UNIT – IV

7. (a) State the need for foundation of Professional Rights. (8)
   (b) Discuss in detail employee rights. (7)

(OR)

8. Analyse a case studies based on environmental ethics. (15)

UNIT – V

9. Explain the functions of engineers as expert witness and advisers. (15)

(OR)

10. Write a short note on :
    (a) Abuses. (5)
    (b) Moral Leadership. (5)
    (c) Integrity. (5)

Name of the Candidate :

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B.E. DEGREE EXAMINATION, 2015

(CIVIL ENGINEERING)

(EIGHTH SEMESTER)

CLEE-805 / 806. HYDRO-POWER ENGINEERING

May] [Time : 3 Hours

Maximum : 75 Marks

(Maximum 60 Marks for those joined before 2011-12)

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL marks.

UNIT – I

1. Explain with neat sketches on the following :

   (a) Pipeline system. (b) Minor losses. (8+7)

(OR)

2. Analysis and design of water distribution with neat sketch. (15)

UNIT – II

3. Write short notes on the following :

   (a) Hydraulic jump. (b) Energy dissipaters. (8+7)

(OR)

4. Briefly outline the following :

   (a) Surge analysis. (b) Dam break analysis. (8+7)

UNIT – III

5. Describe briefly on induced draught and natural draught cooling towers. (15)

(OR)

6. Explain with neat sketch planning, analysis and design of hydro power plant. (15)

UNIT – IV

7. List out the different supporting structures for equipments. Explain any one in detail with neat sketch. (15)

(OR)

8. Write short notes on the following :

   (a) Material handling structures. (b) Intake structures. (8+7)

UNIT – V

9. Write short notes about alignment and layout of cavities in power plants. (15)

(OR)

10. Discuss briefly about the safety requirements during the construction of various power plants. (15)

Register Number: **0431**

Name of the Candidate:

B.E. DEGREE EXAMINATION, 2015

(CIVIL ENGINEERING)

(EIGHTH SEMESTER)

CLEE-806/805. SOLID WASTE AND HAZARDOUS WASTE MANAGEMENT

May] [Time : 3 Hours

Maximum : 75 Marks

Maximum : 60 Marks for those joined before 2011-12

Answer One Full Question from each Unit ***(5 × 15 = 75)***

UNIT – I

1. a) Why is waste management a major problem in cities? (8)

   b) What is the role of the municipality in managing the domestic waste that is generated in a city? (7)

2. Explain the various factors that are affecting the disposal of solid waste in a city. (15)

UNIT – II

3. a) How will you collect the solid wastes generated in a city? (8)

   b) Write a short note on grinding of garbage. (7)

4. Explain in detail about the problems caused by the incinerators in the atmosphere in solid waste management. (15)

UNIT – III

5. a) Discuss in brief about the machines involved in sanitary land fill. (8)

   b) How will you supervise the sanitary land fill site? (7)

6. Explain in detail about the following environmental factors for the sanitary land fill site (a) Odours (b) Flies (c) Vectors (d) Leachate (15)

UNIT – IV

7. a) Explain in what ways we can reduce waste generated in the city. (8)

   b) Write short note on ocean disposal method of solid waste. (7)

8. a) State the importance of impact assessment on solid waste disposal site. (8)

   b) How will you select a site for land fill with reference to cost considerations? (7)

UNIT – V

9. Explain in detail about the precautions to be followed for the disposal of industrial waste and hazards refuse. (15)

10. Discuss in brief about the various composting methods of solid waste with their advantages. (15)