

Register Number :

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**B.E. DEGREE EXAMINATION, 2016**

( CIVIL ENGINEERING )

( EIGHTH SEMESTER )

**CLEC-801. PRE-STRESSED CONCRETE**

November ]

[ Time : 3 Hours

Maximum : 75 Marks

*Answer any FIVE questions, choosing ONE FULL question from each unit.*

*Use of relevant BIS codes is permitted.*

*ALL questions carry EQUAL marks.*

**UNIT - I**

1. A simply supported pre-stressed concrete beam of cross section  $400 \text{ mm} \times 600 \text{ mm}$  covers a span of 10 m. It is subjected to a uniformly distributed load of  $30 \text{ kN/m}$  in addition to its self weight and is pre-stressed with a force of  $1740 \text{ kN}$  with a pre-stressing cable of parabolic profile. The cable is anchored at the centre of gravity of the cross section at support section and has a dip of  $160 \text{ mm}$  at the middle cross section. Analyze the beam for the effects of pre-stressing and the loads at mid cross section using  
(a) Stress concept. (b) Force concept. (c) Load balancing concept. (15)  
(OR)
2. Explain the various post-tensioning systems based on wedge action with sketches. (15)

**UNIT - II**

3. A post-tensioned bounded T-section has a flange of width  $800 \text{ mm}$  and thickness  $250 \text{ mm}$ . Thickness of the web is  $200 \text{ mm}$ . The area of high-tensile steel located at an effective depth of  $1200 \text{ mm}$  is  $4000 \text{ mm}^2$ . The characteristic strength of steel and the cube strength of concrete are  $1500 \text{ N/mm}^2$  and  $40 \text{ N/mm}^2$  respectively. The effective pre-stress after all losses is  $900 \text{ N/mm}^2$  and the ratio of yield stress to the tensile strength of steel is  $0.90$ . Estimate the ultimate moment capacity of the T-section. (15)  
(OR)
4. A pre-stressed beam,  $100 \text{ mm}$  wide by  $250 \text{ mm}$  deep is required to support an ultimate shear force of  $80 \text{ kN}$ . The compressive pre-stress at the centroid axis is  $5 \text{ N/mm}^2$ . The characteristic cube strength of concrete is  $40 \text{ N/mm}^2$ . The cover to the tension reinforcement is  $50 \text{ mm}$ . If the characteristic tensile strength of stirrups is  $415 \text{ N/mm}^2$ , design suitable reinforcements in the section. (15)

## UNIT - III

5. A pre-stressed concrete beam having a symmetrical I-section is to be designed to support a live load of 15 kN/m over an effective span of 12 m. The I-section is made up of flanges 300 mm wide by 150 mm thick and the web is 120 mm thick and 450 mm deep. The permissible stress in concrete may be assumed as  $14 \text{ N/mm}^2$  in compression and  $1.4 \text{ N/mm}^2$  in tension. Loss of stress is 15 %. Determine the minimum pre-stressing force and the corresponding eccentricity. (15)

(OR)

6. A rectangular pre-tensioned concrete beam has a breadth of 100 mm and depth of 230 mm and the pre-stress after all losses have occurred is  $12 \text{ N/mm}^2$  at the soffit and zero at the top. The beam is incorporated in a composite T-beam by casting a top flange of breadth of 300 mm and depth 50 mm. Calculate the maximum uniformly distributed live load that can be supported on a simply supported span of 4.5 m, without any tensile stresses occurring, if
- The slab is externally supported while casting and
  - The pre-tensioned beam supports the weight of the slab while casting. (15)

## UNIT - IV

7. What are the concordant cables? Sketch a typical concordant cable profile in a two span continuous pre-stressed concrete beam? (15)

(OR)

8. Explain with sketches, the various methods of achieving continuity in pre-stressed concrete member. (15)

## UNIT - V

9. Briefly outline the salient design features of cylinder and non-cylinder pipes. (15)

(OR)

10. A cylindrical pre-stressed concrete water tank of internal diameter 28 m to store water to a depth of 8 m is to be designed using M-40 grade concrete. The thickness of tank walls is 150 mm and 5 mm diameter high tensile wires available for use. The permissible compressive stress in concrete at transfer is limited to  $12 \text{ N/mm}^2$ . During service, a residual compressive stress of  $1 \text{ N/mm}^2$  is desired in concrete. The initial stress in high-tensile wire is  $1000 \text{ N/mm}^2$ . The loss of pre-stress is estimated to be 20 %. Assuming the base slab and tank walls are monolithically cast, determine the number of turns of circumferential wire winding and vertical cables and check the wall thickness. (15)

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**B.E. DEGREE EXAMINATION, 2016**

( CIVIL ENGINEERING )

( EIGHTH SEMESTER )

**CLEC-802. MAINTENANCE AND REHABILITATION OF STRUCTURES**

November ]

[ Time : 3 Hours

Maximum : 75 Marks

*Answer any ONE FULL question from each unit.*

*ALL questions carry EQUAL marks.*

**UNIT - I**

1. Discuss the importance and need of rehabilitation and discuss the various aspects of inspection.  
(OR)
2. Explain in detail the assessment procedure for evaluating a damaged structure.

**UNIT - II**

3. Discuss in detail the permeability and thermal properties in concrete structures.  
(OR)
4. How does cover thickness play a major role in inducing corrosion?

**UNIT - III**

5. What is the necessity of using fibre reinforced concrete and state its advantages.  
(OR)
6. Write in detail about cathodic protection with a neat sketch.

**UNIT - IV**

7. Discuss in detail the different forms of cracking pattern and procedure for rehabilitation.  
(OR)
8. Explain in detail the methods followed to avoid marine exposure.

**UNIT - V**

9. Explain about the recent techniques adopted for demolishing a structure which failed structurally.  
(OR)
10. Enumerate any one case study you have come across with regarding demolition of high rise building.

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**B.E. DEGREE EXAMINATION, 2016**

( CIVIL ENGINEERING )

( EIGHTH SEMESTER )

**CLEC-803. INTERIOR DECORATION AND PLANNING**

November ]

[ Time : 3 Hours

Maximum : 75 Marks

*Answer any ONE FULL question from each unit.*

*ALL questions carry EQUAL marks.*

**UNIT - I**

1. Explain the principal elements of interior design with diagrams.  
(OR)
2. With neat diagram, explain the ergonomic triangle for a modular kitchen.

**UNIT - II**

3. What are decorative furnitures? Where they are used? Explain briefly.  
(OR)
4. Explain the furniture arrangement for a living room and an office.

**UNIT - III**

5. Bring out the functional and aesthetic characters of materials for ceiling, wall, flooring with a few methods of construction.

(OR)

6. Explain any five bathroom fittings used in bathroom design with neat sketches.

**UNIT - IV**

7. Explain in detail  
(a) Hollow clay block partition. (b) Plywood block board partition.

(OR)

8. Give sketches of dog-legged stair and open newel stair. Discuss them in detail.

**UNIT - V**

9. Explain the various principles of designing a landscape with suitable illustration.

(OR)

10. What is a landscape drawing? How a landscape drawing is prepared manually and through CAD.

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**B.E. DEGREE EXAMINATION, 2016**

( COMMON TO ALL BRANCHES )

( EIGHTH SEMESTER )

**CLEC-804. ETHICS IN ENGINEERING**

November ]

[ Time : 3 Hours

Maximum : 75 Marks

*Answer any ONE FULL question from each unit.*

*ALL questions carry EQUAL marks.*

**UNIT - I**

1. (a) List out the types of inquiry. (5)  
(b) Discuss the Gilligan's theory. (10)

(OR)

2. How will you relate professional and ordinary morality? (15)

**UNIT - II**

3. Justify Engineering as social experimentation. (15)

(OR)

4. Discuss in detail the concept of safety and acceptability of risk lessons for the engineer. (15)

**UNIT - III**

5. (a) List out the responsibilities to employers. (5)  
(b) Discuss in detail the Professionalism and Loyalty. (10)

(OR)

6. (a) Explain the faithful agent argument. (5)  
(b) Write short notes on conflicts of interest and price fixing. (10)

**UNIT - IV**

7. Justify the foundation of Professional Rights. (15)

(OR)

8. Analyse a case study based on weapons development. (15)

**UNIT - V**

9. List out the methods for resolution of disputes. (15)

(OR)

10. Write short notes on :

- (a) Competitive bidding. (b) Integrity and ingenuity.  
(c) Citicorp skyscraper.

(5 + 5 + 5)

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**B.E. DEGREE EXAMINATION, 2016**

[ CIVIL ENGINEERING ]

( EIGHTH SEMESTER )

**CLEE - 805 / 806. HYDRO - POWER ENGINEERING**

( Elective - III )

November]

[Time : 3 Hours

Maximum : 75 Marks.

*Answer any ONE FULL question from each unit.*

*ALL questions carry EQUAL marks.*

( 5 × 15 = 75 )

**UNIT - I**

1. Explain the following:

- (a) Transient control using surge tanks. (b) Control valves.

(OR)

2. What are all the appurtenances used in pumps. Explain briefly each term.

**UNIT - II**

3. Explain the design principles of spillways.

(OR)

4. Derive: "Depth of hydraulic jump".

**UNIT - III**

5. Explain with neat sketch planning, analysis and design of a thermal power plant.

(OR)

6. Differentiate between induced draught and natural draught cooling towers.

**UNIT - IV**

7. Explain with neat sketch of "turbo generator foundation".

(OR)

8. List out the different storage structures. Explain any one in detail with neat sketch.

**UNIT - V**

9. Briefly explain the following:

- (a) Sizing of a power house. (b) Joints in hydro power plants.

(OR)

10. Briefly explain about power plant structure. Also, draw a detailed layout of a hydro power plant.

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**B.E. DEGREE EXAMINATION, 2016**

(CIVIL ENGINEERING)

(EIGHTH SEMESTER)

**CLEE-806. INDUSTRIAL WASTE WATER TREATMENT AND DISPOSAL**

(Elective-IV)

November]

[Time : 3 Hours

Maximum : 75 Marks

*Answer any ONE FULL question from each UNIT*

(5 × 15= 75)

UNIT-I

1. Discuss in detail about the Physical unit processes commonly used in waste water treatment.
2. Explain the process for removal of color and odour from waste water by activated carbon filtration.

UNIT-II

3. Discuss the characterization waste water from textile industry.
4. Discuss the characterization waste water from leather industry.

UNIT-III

5. Explain the mechanism of soda recovery in pulp and paper mills.
6. Explain about conventional method of treatment for industrial wastewater.

UNIT-IV

7. Explain chemical process for removal of heavy metals from waste water.
8. Explain briefly about the activated sludge process water.

UNIT-V

9. Bring out clearly the differences among physical, chemical and biological treatment of tannery waste.
  10. What are the factors to be considered for the use of treated municipal waste water in industries?
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**B.E. DEGREE EXAMINATION, 2016**

[ CIVIL ENGINEERING ]

(EIGHTH SEMESTER)

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

( Elective - IV )

November]

[Time : 3 Hours

Maximum : 75 Marks.

*Answer any ONE FULL question from each unit.*

*ALL questions carry EQUAL marks.*

**UNIT - I**

1. Explain in detail the goals and objectives of solid waste management.

(OR)

2. Explain the various methods of disposal of solid wastes.

**UNIT - II**

3. Explain the various methods of storage of solid wastes.

(OR)

4. Explain the various types of vehicles used in collection and transporting.

**UNIT - III**

5. Explain with the aid of sketch, the typical layout of a landfill, and also, various facilities at a landfill site.

(OR)

6. What are the major contaminants in a Leachate? Explain its effects on ground water.

**UNIT - IV**

7. Explain the significance of recovery and reuses in solid waste management.

(OR)

8. Explain the various constraints to achieve effective waste disposal.

**UNIT - V**

9. Explain the various classifications of Hazardous wastes.

(OR)

10. Explain in detail the various composting methods.