F 3818

Reg. No....................................

Name..

B.TECH. DEGREE EXAMINATION, NOVEMBER 2016

Eighth Semester

Branch : Civil Engineering

ADVANCED STRUCTURAL DESIGN (CE)

(New Scheme – 2010 Admission onwards)

[Supplementary]

Time : Three Hours

Maximum : 100 Marks.

Part A

Answer **all** *questions.*

Each question carries 3 marks.

1. Explain IRC loadings on bridges.

2. Discuss membrane stresses.

3. List the forces acting on steel trusses.

4. Explain the applications of plate girder.

5. Sketch the cross-section of a plate girder highway bridge.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*

Each question carries 5 marks.

6. Explain the design principle of bearings for bridges.

7. Discuss the structural behaviour of plates.

8. Discuss the design procedure for purlin in roof.

9. Discuss the criteria for design of gantry girder.

10. Discuss the loads acting on highway bridges.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*

Each question carries 12 marks.

11. Design a box culvert having inside dimensions 3.5 m × 3.5 m. The box culvert is subjected to a superimposed dead load of 12000 N/m^2 and a live load of 45000 N/m^2 from the top. Assume unit weight of soil as 18000 N/m^3 and angle of repose of 30°. Use M20 concrete and Fe 415 steel.

Or

Turn over

12. Design a T-beam bridge for the following data :

        Clear width of roadway   = 7 m

        Span centre of bearing   = 16 m

        Live load = one lane of class A or two lanes of class A loading.

        Average thickness of wearing coat   = 8 cm

        Use M 200 concrete for desk slab and M 150 concrete for beam.

13. Design a simply supported cylindrical shell roof with the following details. Radius of the shell is 6 m and span is 24 m and the thickness of the shell is 60 mm. Take live load of 2 kN/m^2. Use M20 concrete and Fe 415 steel. Sketch the details.

Or

14. Design a reinforced concrete shell with a circular directrix with the following dimensions. Distance between the traverse is 40 m, Radius of shell is 6 m, and thickness of shell is 40 mm and semi central angle is 60 degree. L. L is 200 N/mm^2. Use M20 concrete and Fe 415 steel.

15. Design a pratt type roof truss for an industrial building given the following data. Overall length is 40 m, overall width is 16 m, width of c/c of roof columns is 14 m, height of column is 10 m, roofing material is asbestos cement sheets.

Or

16. The trusses for a factory building is located spaced at 8 m c/c and the purlin are spaced at 1.5 m c/c. The pitch of the truss is 28° and the span of the truss is 20 m. The roof consists of asbestos sheets with weight 15 kN/m^2. Design : (i) Suitable section purling ; and (ii) Angle section purling and properly sketch the connections with ACC sheets to purling.

17. Design a 8 m gantry girder for a 156 kN E.O.T. crane with 3 m wheel base. The maximum load on each carriage wheel is 100 kN. Allow an impact of 30 per cent. Assume the effect of lateral forces to be carried equally by all the wheels of crane girders to one-seventh capacity of the crane treated as a live load.

Or

18. A plate girder section is made up of web of 200 cm × 1.2 cm, and flange angles 150 mm × 150 mm × 12 mm and one cover plate in each flange of 45 cm × 1.2 cm. The girder is supported at either end on bearing plates 50 cm × 50 cm. If the maximum end reaction is 1640 kN, design the end stiffener using a cluster of 4 angles 130 mm × 130 mm × 12 mm.

19. The effective span of a through type plate girder two lane bridge is 36 m. The reinforced concrete slab is 250 mm thick inclusive of wearing coat. The footpaths are provided on their sides of carriageway. The cross girder are provided at 3 m center. The stringers are spaced at 2.45 m c/c the spacing between the main girder is 9.80 m. Determine the maximum sections for the stringers if bridge is to carry IRC class A standard loading.

Or

20. In a plate girder through type bridge carrying a single broad gauge track, the cross girder are provided at 5 m centers. The stringers are spaced 2.5 m from c/c. Using the data given below, design the cross girders :

        Spacing between the main girder   = 4 m

        EUDLL for 4 m for BM per track   = 592 kN

        EUDLL for 4 m for shear per track = 788 kN.

                                               (5 × 12 = 60 marks)

B.TECH. DEGREE EXAMINATION, NOVEMBER 2016

Eighth Semester

Branch : Civil Engineering

CE 010 805 G02—ENVIRONMENTAL POLLUTION CONTROL TECHNIQUES
(Elective IV) [CE]

(New Scheme—2010 Admission onwards)

[Supplementary]

Time : Three Hours   Maximum : 100 Marks

Part A

Answer all questions.
Each question carries 3 marks.

1. What is the theory of separation of particulates in fabric filter ?

2. List out the control techniques for particulate matter.

3. What is meant by neutralization ?

4. Define solid and hazardous waste.

5. What are the control measures in noise pollution ?

(5 × 3 = 15 marks)

Part B

Answer all questions.
Each question carries 5 marks.

6. Explain the principle of electrostatic precipitator.

7. What are the various types of pollutants that affect water?

8. Explain in detail about waste volume reduction.

9. Discuss about incineration.

10. Explain the sources of noise pollution.

(5 × 5 = 25 marks)

Turn over

Part C

Answer all questions.
Each full question carries 12 marks.

11. Write short notes on :

    (a) Settling Chamber.

    (b) Wet Collectors.

    (c) Cyclone separator.

Or

12. Explain the sources and classification of Air Pollution. Describe the effects of air pollution.

13. Compare the Physico Chemical treatment versus Biological methods.

Or

14. Explain the working of Oil Skimmer and Trickling Filter.

15. Briefly explain the Physical, Chemical and Biological characteristics of industrial wastes.

Or

16. Explain the process of high rate Anaerobic treatment in Industrial waste.

17. Explain the process of disposal methods of solid wastes, with respect to site selection, design and operation of sanitary land fills.

Or

18. Explain the techniques involved in the process of Reduction-Recycling-Reuse of solid waste.

19. Discuss in detail salient features of Indian legislation regarding Handling and Management of Noise Pollution.

Or

20. Explain in detail about the Environmental Pollution Laws and Acts.

(5 × 12 = 60 marks)