

B.TECH. DEGREE EXAMINATION, MAY 2018**Eighth Semester****Civil Engineering****CE 010 801 – ADVANCED STRUCTURAL DESIGN (CE)****(New Scheme – 2010 Admission onwards)****[Regular/Supplementary]****Time : Three Hours****Maximum : 100 Marks****Part A****Answer all questions.****Each question carries 3 marks.**

1. List the forces acting on road bridges.
2. Discuss the applications of shell structures.
3. List the various forces acting on an industrial building roof.
4. Sketch and explain various parts of plate girder.
5. Discuss the merits and demerits of high way steel bridges.

(5 × 3 = 15 marks)**Part B****Answer all questions.****Each question carries 5 marks.**

6. State the specifications for box culvert.
7. State the general principles of folded plates.
8. Explain the classification of steel truss.
9. Distinguish between plate girder and gantry girder.
10. State IS specifications for steel railway bridges.

(5 × 5 = 25 marks)**Turn over**

Part C*Answer all questions.**Each question carries 12 marks.*

11. A T-beam bridge has to be provided across a river for the particulars given below :

Flood discharge = 25 cum/s, River bed width = 15 M

Side slope = 1.5 H to 1 V. Bed level = +42.50 M, High flood level = + 43.75 M

Maximum allowable afflux = 1.25 M, Ground level = + 45.10 M.

Hard rock available = + 40.15, Road formation level = + 48.25 M

Foot path = 1.25 M , Road, NH-two line traffic. Loading, IRC Class A

Use M40 concrete and Fe 415 steel.

Select the cross section of the bridge and design the deck slab. Sketch the cross section and details of reinforcement.

Or

12. Design a box-culvert for the following data :

Width of garage way = 8 M, Foot path on either side = 1.2 M, Span 5 M, Height of vent = 2 M

Use M25 concrete and Fe 415 steel, Sketch the details of reinforcement.

13. Design a cylindrical shell for the following particulars.

Radius of the shell = 10 M, Thickness of the shell = 60 MM, Span = 40 M,

Semi central angle = 60 degrees, Live load = 200 N/sq.mm.

Use M20 concrete and Fe 415 steel. Sketch the details of reinforcement.

Or

14. Explain the design for a simply supported single barrel cylindrical shell for membrane stress.

15. Sketch and explain the structural details of the steel roof for an industrial building having effective span 60 M.

Or

16. Explain the principle of design of bracings and supporting system for steel roof.

17. The effective span of a deck type plate girder two line traffic highway bridge is 40 M.

Design the maximum section of the plate girder if the bridge is to carry IRC class A loading.

Assume any other data required suitably.

Or

18. Sketch the details of gantry girder and explain the design procedure and applications.

19. Design a plate girder of 20 m span, using the tension field action for the following fractured forces. $M_z = 6000$ kNm, maximum shear force = 1100 kN. The girder is laterally restricted.

Or

20. A through type plate girder is provided for a single broad gauge track, Cross-girders are spaced 3 m. apart, the total span of main girder from c/c of bearings bring 25 m. The stringers are at 2 m. b/w centre lines 0.6 kN/m. stock rails and 0.4 kN/m. Check rails are provided. Sleepers are spaced at 450 mm. c/c and are of size $2.8 \text{ m} \times 250 \text{ mm} \times 250 \text{ mm}$. Weight of timber = 7.5 kN/m^3 . Find maximum section of main girder if EUDLL for BM is 2800 kN per track total for BM, and EUDLL for shear 3023 kN per track total, impact factor of 25 m = 0.45. Main girder are provided at a spacing of 5 m. b/w centre lines.

(5 × 12 = 60 marks)

(M)

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B.TECH. DEGREE EXAMINATION, MAY 2018

Eighth Semester

Civil Engineering

CE 010 802 – BUILDING TECHNOLOGY AND MANAGEMENT (CE)

(New Scheme – 2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. List the materials used for form work for concreting.
2. Write short note on wall panels.
3. Define Project.
4. What is a contractor?
5. Write short note on earnest money.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Write brief note on fibre reinforced concrete.
7. Discuss the advantages of prefabricated structures.
8. Write short note on technical planning.
9. Discuss the procedure for item rate contract.
10. Explain warranty period.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each full question carries 12 marks.

11. Explain BIS method of concrete mix design.

Or

12. List and explain the tests required for materials used for concrete mix design.

Turn over

13. Explain ferro cement. Discuss the applications of ferro cement.

Or

14. Explain the principle of value analysis. Discuss different methods of value analysis.

15. Discuss the objectives of Civil Engineering Works Management.

Or

16. Discuss any *one* method of execution of a civil engineering project.

17. Discuss the procedure and merits and demerits of following contracts :

(a) Global contract.

(b) Cost plus fluctuating contract.

Or

18. Explain the functions of materials management.

19. Explain voidable contracts and their performance.

Or

20. Explain with examples liability for tort in contract.

(5 × 12 = 60 marks)



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B.TECH. DEGREE EXAMINATION, MAY 2018

Eighth Semester

Civil Engineering

CE 010 803 – ENVIRONMENTAL ENGINEERING-II (CE)

(New Scheme – 2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Define peak factor in quantity of sewage.
2. Write brief note on crown corrosion.
3. List KSPCB effluent standards.
4. Explain stabilization ponds.
5. Explain sludge thickening.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain intensity duration curve for storm sewage.
7. Write short note on sewage faming.
8. Discuss the objectives of waste water treatment.
9. Explain aerated lagoons.
10. Explain anaerobic digestion.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each full question carries 12 marks.

11. Explain the physical and chemical characteristics of sewage. Discuss the analysis and reporting.

Or

Turn over

12. Discuss the effect of variation of discharge on velocity in sewage flow. Design a circular sewer for a population of 40000 for a municipality. The rate of water supply is limited to 100 lpcd. Anticipated rate of flow to sewer is 75% of supply. The sewers are laid at a slope of 1 in 800. The sewer should be designed for four times the flow in dry weather when running full. Given $N = 0.013$.
13. Explain the principle, design procedure, construction and materials for construction for sewers.
- Or*
14. Explain the functions and construction details of following sewer appurtenances :
(a) Manholes ; (b) Grease and oil traps.
15. Explain with neat sketches function, design, construction and operation of grit chamber.
- Or*
16. Design a bar screen chamber for a average sewage flow of 30 MLD, minimum sewage flow of 20 MLD and maximum sewage flow of 40 MLD. Sketch and explain the function of screen chamber.
17. Explain the principle of biological treatment of sewage.
- Or*
18. Explain the design, construction and operation of trickling filters.
19. Explain the design sludge digesters.
- Or*
20. Design a septic tank for 50 persons for a hostel. Give detailed drawings.

(5 × 12 = 60 marks)



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B.TECH. DEGREE EXAMINATION, MAY 2018

Eighth Semester

Civil Engineering

CE 010 804 L02 – ENVIRONMENTAL GEOTECHNIQUES (Elective III) [CE]

(New Scheme – 2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Write notes on electric charges on clay minerals.
2. What are the factors affecting permeability?
3. What are Contaminants?
4. What are the factors considered for the selection of sites for waste disposal?
5. Distinguish between rigid liners and flexible liners.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Describe adsorbed water-soil structure.
7. What is sensitivity? What are the causes of sensitivity?
8. Enlist the characteristics of Hazardous waste.
9. What is the necessity of land fill cover and liner?
10. Briefly explain the necessity for engineering ground improvement.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each full question carries 12 marks.

11. Explain various methods for identification of minerals.

Or

12. Describe basic structural units of clay minerals.

Turn over

13. Describe the various factor controlling resistance to volume change.

Or

14. Enumerate hydraulic conductivity of different types of soils.

15. Describe various methods used for measuring generation rate of wastes.

Or

16. Explain the advective transport of contaminants in ground water.

17. Explain how high level radio active wastes are dispersed.

Or

18. Draw a cross section of a typical solid waste land fill and label the parts.

19. Explain various ground modification techniques used in waste management.

Or

20. Describe the use of geotextile and geomembrane for ground improvement.

(5 × 12 = 60 marks)

B.TECH. DEGREE EXAMINATION, MAY 2018**Eighth Semester****Civil Engineering****CE 010 804 L05 – HIGHWAY AND AIRFIELD PAVEMENTS (Elective III) [CE]****(New Scheme – 2010 Admission onwards)****[Regular/Supplementary]**

Time : Three Hours

Maximum : 100 Marks

Part A*Answer all questions.**Each question carries 3 marks.*

1. List the forces acting on pavements.
2. Discuss the site investigations required for flexible road construction.
3. Define relative stiffness.
4. Explain functional stresses.
5. Explain roughness of road surfaces.

(5 × 3 = 15 marks)

Part B*Answer all questions.**Each question carries 5 marks.*

6. Define equivalent single wheel load.
7. State IRC recommendations for design of flexible roads.
8. List the merits and demerits of rigid pavements.
9. Discuss necessity of joints in concrete roads.
10. Explain different types of pavement distress.

(5 × 5 = 25 marks)

Part C*Answer all questions.**Each full question carries 12 marks.*

11. Discuss the structural behaviour of rigid roads. List the site conditions suitable for rigid road. Explain the impact of climate on rigid roads.

Or

12. Discuss the importance of sub grade in road construction. Discuss the theoretical conditions of Sub grade. Explain the climatic effect on sub grade.

Turn over

13. Explain group index method of design of flexible roads. List the merits and demerits of this method.

Or

14. Design a High way pavement flexible type for a wheel load of 41 kN with a tyre pressure of 50 N/sq.cm. Adopt McLeod's method. The plate load bearing test carried out on sub grade soil using 300 mm diameter plate yield a pressure of 25 N/sq.cm. after 10 repetition of load at 5 mm deflection.
15. Calculate the stress at interior, edge and corner of a CC pavement by Westergaard's equation. Wheel load = 5200 kg, E of concrete 3×10^5 kg/cm². Thickness of pavement 40 cm, Poisson's ratio of concrete is 0.15 m, Modulus of sub grade reaction 2.5 kg/cm², Radius of contact area = 30 cm.

Or

16. Determine the warping stresses at interior, edge and corners for a concrete pavement of thickness 200 mm with transverse joints at 5 M spacing. The width of slab is 3.6 M. For concrete $E = 3 \times 10^6$ N/sq.cm. and $\mu = 0.15$, k value of sub grade = 50 N/cu cm. The temperature differential is 0.9 C per cm. Assume thermal coefficient for concrete as 10×10^{-6} per degree C.
17. Design size and spacing of dowel bars at an expansion joint of concrete pavement of thickness 20 cm. Given the radius of relative stiffness of 90 cm, design wheel load 4,000 kg, load capacity of the dowel system is 40 percent of design wheel load, Joint width is 3.0 c, and the permissible stress in shear, bending and bearing stress in dowel bars are 1,000, 1,500 and 100 kg/cm² respectively.

Or

18. A concrete slab of 240 mm thick is constructed over a sub base having modulus of sub grade reaction 120 N/cu.cm. The temperature differential between bottom and top of the slab is 13 degree C. The spacing between the construction joints is 5 M and that between the longitudinal joints is 4 M. The design wheel load is 41 kN, radius of contact area 200 mm, then using IRC charts and the worst combination of stresses. Assume any other data required suitably.
19. Explain pavement instrumentation.

Or

20. Explain concrete road maintenance works.

(5 × 12 = 60 marks)

(M)

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B.TECH. DEGREE EXAMINATION, MAY 2018

Eighth Semester

Branch : Civil Engineering

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

(New Scheme—2010 Admission onwards)

[Regular/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Define air pollution. Enlist the sources of air pollution.
2. Mention any *five* chemical characteristics of water and discuss their impact on quality of water.
3. What are the objectives of purification in industrial waste water ?
4. What are the sources and types of solid waste ?
5. Define noise pollution and threshold of hearing.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. What you meant by criteria pollutant ? Give examples.
7. What is water pollution ? Differentiate between the point source and diffused sources of water pollution.
8. Differentiate between equalization and propotioning.
9. Explain the types of collection services used for residential and commercial-industrial sources.
10. What measures can be taken for the suppression of noise at source ?

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each full question carries 12 marks.

11. What are the various control of particulate pollutants ? Explain any *one* of them.

Or

Turn over

12. Explain the working of electrostatic precipitator and mention its merits and demerits.

13. With the help of flow diagram, explain the working of a trickling filter.

Or

14. Complete the process of purification between trickling filter and activated sludge process.

15. What are the various methods for neutralizing over acidity/alkalinity of waste water ? Explain any *one* of them in detail.

Or

16. Describe the significance of Lagooning in industrial waste treatment.

17. What is composting ? What are the types of composting ? What are the advantages and disadvantages ?

Or

18. Describe various waste minimization strategies used in solid waste management.

19. Discuss salient features of environmental protection laws and act.

Or

20. Discuss the various methods used to control noise pollution.

(5 × 12 = 60 marks)

B.TECH. DEGREE EXAMINATION, MAY 2018**Eighth Semester**

Branch : Civil Engineering

E 010 805 G06—REMOTE SENSING AND GIS APPLICATIONS (Elective IV) [CE]

(New Scheme—2010 Admission onwards)

[Regular/Supplementary]

Three Hours

Maximum : 100 Marks

Part A*Answer all questions.**Each question carries 3 marks.*

Define remote sensing.

Discuss applications of EMR in earth surface studies.

Explain synthetic aperture radar.

Explain working of printers.

Explain image classification.

(5 × 3 = 15 marks)

Part B*Answer all questions.**Each question carries 5 marks.*

Explain Stefan-Boltzman law.

Explain spectral signature curves.

Explain multi spectral scanning.

Explain spatial and non-spatial maps.

Explain image enhancement.

(5 × 5 = 25 marks)

Part C*Answer all questions.**Each full question carries 12 marks.*

Explain Platforms. Discuss areal and space platforms.

Or

Explain black body radiation.

Turn over

Explain scattering of electromagnetic radiation.

Or

Discuss electromagnetic radiation with water and soil.

Explain Satellites. Discuss the classification based on purpose.

Or

Explain the principle and applications of microwave remote sensing.

Discuss the components of Geographic information system.

Or

Explain raster and vector data structure in detail.

Discuss supervised and unsupervised integration of GIS and remote sensing.

Or

Discuss the applications of remote sensing and GIS for watershed management.

(5 × 12 = 60 marks)