Code No. D-2164/ AICTE

FACULTY OF ENGINEERING

B.E. (Civil) VI - Semester (AICTE) (Backlog) Examination, March / April 2022

Subject: Steel Structures

Professional Elective – III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 Calculate allowable deflection for vertical live load on steel beam of residential building of span.
2 List out the various factors on which design wind pressure on roof trusses is calculated.
3 Calculate maximum allowable slenderness ratio for ISLB 200 section whose effective length is 3m and which is always in tension.
4 What are the properties that are affected by presence of carbon in structural steel?
5 What do you understand by residual stresses?
6 Differentiate between laterally supported beam and laterally unsupported beam.
7 List any four built-up sections for columns with neat sketches.
8 List any five types of tension members.
9 Calculate the class of section for ISLB 250 section as per IS 800-2007.
10 How do you decide width and thickness of a lacing member in compression?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 An ISLC 250 @ 28.0 kg/m Fe 410 grade of steel is to carry a factored tensile force of 750 kN. The channel section is to be welded at site to a gusset plate of 10mm thick. Design a fillet weld, if the overlap is limited to 250mm. Use limit state design.

12 A tension member ISA 125mm x 75mm x 10mm is connected by its longer leg to a 10mm thick gusset plate using 5 Nos of M20 bolts of grade 4.6. Find the load carrying capacity of the tension member. Use limit state design method.

13 Design a laterally unsupported beam of span 4.5m subjected to a load of 40 kN/m. The ends of the beam are simply supported.

14 Design a 2.4m long single angle strut of a roof truss to carry a load of 95kN connected by two bolts at ends. Assume that Strut is loaded through one leg.

15 Design a built-up laced column with four angles to support a axial load of 750kN. The column is 10m long whose both ends are held in position and restrained against rotation. Assume Fe 410 grade steel.

16 Design a base plate for ISHB 200 column section subjected to a factored moment of 35 kNm and a factored axial load of 600 kN. The characteristic strength of concrete foundation under base plate is 25 N/mm^2. Use grade Fe410 steel.

17 Design a I section purlin for a roof truss spaced 4m c/c supporting sheeting whose dead load is 0.20 kN/m^2. The purlins are spaced 1.2m c/c on trusses sloping 18° to the horizontal. A live load of 1.1 kN/m^2 and wind load of 1.8 kN/m^2 normal to roof surface is acting on the purlins.

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Code No. D-3132/O

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II-Semester (Old) (NON-CBCS) (Backlog) Examination, March/April 2022

Subject: Water Resources Engineering Management – I

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

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(25 Marks)**

1. List out the different forms of precipitations.
2. Distinguish between aquiclude, acquitard and aquifuge.
3. Distinguish between base period and crop period.
4. State the advantages of canal lining.
5. Explain the functions of river training works.
6. Mention the conditions to be considered in the determination of top width of a weir.
7. State the circumstances in which a cylinder canal fall is to be adopted.
8. List the requirements of good canal outlet.
9. Define the term warabandhi.
10. Distinguish between a single and multipurpose project.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) Explain how the constant f_o f_n and k in Horton's equation can be determined from experimental data.
(b) Explain the factors affecting evaporation.

12 A gravity well has a diameter of 1.0m. Before pumping is started the depth of water in the well is 50.0m. When pumping is being done at the rate of 2000 lpm the draw down in well 20.0m away is 4.0m and in another well 40.0m away is 2.0m. Determine the radius of influence of the well, coefficient of permeability, draw down in the well specific capacity of the well and the maximum rate at which water can be pumped form the well.

13 (a) Design an channel with Garret's diagram for a discharge of 3.7 cumec, bed slope of 0.25 m/km, rugosity coefficient (n) is 0.0225, critical velocity ratio (m) is 1.0 and side slopes are 0.5:1.
(b) Deign an irrigation channel by Kennedy's theory for the following data:
Full supply discharge is 6 cumec, bed slope is 1in 5000. Critical velocity ratio (m) is 1.0 and rugosity coefficient (n) is 0.0225.

14 (a) Draw a neat sketch with various components of diversion head works. State the function of each component briefly.
(b) Briefly explain the design principles of vertical drop weir.

15 (a) Explain the principles involved in design of the roof slab of a siphon aqueduct.
(b) Sketch the different types of aqueducts.

16 (a) Explain the design principles of a trapezoidal notch fall.
(b) Explain the design principles of non modular outlet.

17 (a) State the different approaches adopted in any project analysis.
(b) List the components to be considered in the feasibility report of a project.

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Code No. D-3685/CBCS

FACULTY OF ENGINEERING

B.E. (ECE) VI –Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Optical Communication
Professional Elective – I

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. Explain Snell's Law with diagram.
2. Describe quantum nature of light.
3. Write on Direct and Indirect Band gap energy.
4. What is intermodal dispersion?
5. For an Optical source, explain Internal and External optical efficiency.
6. Explain 'Population inversion'.
7. List the Characteristics of Optical Detector
8. Give the expression for responsivity of avalanche photodiode.
9. Write the considerations for a point to point link in Optical Communication
10. Give the basic applications of optical amplifiers.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. (a) Explain the light propagation in graded index fibers with neat diagrams.
    (b) Determine V-number for step-index fiber at 820nm having 25μmts core radius, The core and cladding refractive indices are 1.48 and 1.46 respectively.

12. (a) Discuss Attenuation mechanism encountered in Optical Communication. Explain different types of optical power loss mechanisms
    (b) What is signal distortion in fiber? Explain the material, waveguide and intermodal dispersion.

13. (a) Explain the operation of surface-emitting LED.
    (b) What are the major requirements of a good fiber connector design?

14. (a) Discuss different types of Optical amplifier configurations used. Explain the optical signal gain concept in SOA.
    (b) Explain how the principle of Impact ionization used in reach through APD for increased optical gain.

15. Give the block diagram of a fiber optic receiver showing different types of noises generated. Explain about each type of noise giving expressions.

16. (a) Write the considerations for a point to point link in optical communication. Explain the concept of Power and Rise time Budget in Optical links
    (b) What are the noise effects on system performance?

17. Write short notes on
    (a) WDM requirement with block diagram
    (b) Optical interfaces SONET/SDH.

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