

4716**BOARD DIPLOMA EXAMINATION, (C-14)****JUNE-2019****DCE - SIXTH SEMESTER EXAMINATION**

DESIGN OF STEEL STRUCTURES

Time:3 Hours

Max.Marks:80

PART-A**10x3=30M**

Instructions: 1) Answer all questions.Each question carries three marks.
2) Answers should be brief and straight to the point and shall not exceed five simple sentences.
3) Use of I-S.800-2007,IS 875-1987 and steel tables are permitted.
4) Assume any suitable data if necessary.

- 1) Write three advantages and three disadvantages of steel structures?
- 2) Draw a neat sketch of fillet weld and butt weld and label them.?
- 3) Write any six forms of tension members with neat sketches.
- 4) What is meant by shear lug?
- 5) Define a) Column b) Strut
- 6) What is a column base? Mention its types?
- 7) What is a beam? State the classification of beams?
- 8) What is a shape factor?
- 9) Draw the line diagram of a) Fink truss b) North light roof truss.
- 10) Calculate the live load on a sloping roof having a slope of 38° ?

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PART-B

10x5=50M

Instructions: 1) Answer any five questions. Each question carries ten marks.
2) Answers should be comprehensive and the criterion for valuation is content but not the length of the answer.

- 11) A single angle ISA 110x110x10 mm carrying an axial design tension of 220 KN is connected to a gusset plate of 12 mm thickness by a lap joint using side fillet and end fillet welds. Design the joint. Take design shear stress in fillet weld as 150 MPa.
- 12) A T-Section ISHT 75 @153 N/m is used as a tie member. The flange is to be connected to gusset plate by side and end fillet welds. Keeping the length of the connection equal to the width of the flange of the section, determine the design strength due to yielding of gross area and design strength due to rupture of critical section. Take yield stress and ultimate stress are 300MPa and 440MPa respectively.
- 13) Design a slab base for a column ISHB 300 @ 630N/m to carry an axial factored load of 1200KN. Assume fe 410 grade steel &M20 grade concrete is used . Provide welded connection between column and base plate.
- 14) Write down any five design specifications for
(i) Lacing (ii) Baterns 5+5 =10
- 15) Design a steel column using single I-section to carry an axial load of 900 KN, the length of the column is 5m with both ends pinned. Take $f_y = 250 \text{ N/mm}^2$.
- 16) A simply supported beam ISMB300 @ 442 N/m has an effective span of 6m. find 6+4=10
a) Design bending strength of the beam.
b) Design shear strength of the beam. Assume Fe 410 grade steel and assume that the beam is laterally supported?
- 17) Find the shape factor for a T-section having flange dimensions 100x10 mm and web dimensions 200x10 mm.
- 18) A power plant structure having maximum dimension more than 60m is proposed to be built on downhill side near vijayawada. The height of the hill is 300 m with a slope of 1 in 3. If the location is 200m from the crest of a hill on downward slope and its eve board is at a height of 10m Determine the design wind pressure?