C16-**C-501**

6620

BOARD DIPLOMA EXAMINATIONS

SEPTEMBER/OCTOBER-2020

DCE – FIFTH SEMESTER

STEEL STRUCTURES

Time: 3 hours Max. Marks: 80

PART – A **3 X 10 = 30**

Instructions: *1. Answer **all** questions.*
*2. Each question carries **Three** Marks.*
3. Answer should be brief and straight to the point and should not exceed Five simple sentences.

1. List the advantages and disadvantages of steel structures.
2. Name different types of welds and sketch any one of them.
3. Calculate the design strength of welded joint if the size of weld is 5mm and length is 250mm. The ultimate shear stress in the weld is 410 N/mm^2. Assume connection are made in the work shop.
4. Calculate the design strength of a tension member due to yielding of gross section for a plate of 150 X 80 mm. Take f_y= 250 N/mm^2.
5. State the different forms of compression members.
6. Sketch the sectional elevation of slab base and label the components.
7. State the situations where the plate girders are necessary.
8. Define shape factor and mention the shape factors to a rectangular and circular secrtion.
9. State the various loads on roof truss.
10. Determine the live load on a truss if the angle of slope of roof truss is 25^0.

PART – B **5 X 10 = 50**

Instructions: *1. Answer any **Five** questions*
*2. Each question carries **TEN** Marks.*
3. Answer should be comprehensive and Criteria for Valuation is the content but not the length of the answer.

11. A tie in a truss consists on an ISA 100 X 75 X 8 mm connected to a 10 mm thick gusset plate through the longer leg by shop fillet weld. Design side fillet welded joint if the permissible stress in the angle and ultimate stress in the fillet weld are 150 Mpa and 410 Mpa respectively.

12. Determine the design tensile strength of single angle ISA 150 X 75 X 10 mm connected to the gusset plate by 6mm size fillet welds with its longer leg. The length of weld is 250 mm. f_y= 250 N/mm^2, f_u= 410 N/mm^2.

13. Determine the design strength of axially loaded column ISHB 300@ 588 N/m, if the length of column is 4m and its both ends are hinged. Take f_y= 250 N/mm^2, f_u= 410 N/mm^2, E = 2x 10^5 N/mm^2.

14. Design a single angle section to carry a compressive load of 125 KN. The c/c distance between the End Connection is 2m. Provide fillet welded joints. Yield stress of steel is 250 Mpa.

15. State the various design specifications for lacing as per IS 8000-21007.

16. An ISLB 500@750 N/m is used as simply supported beam of span 5 m carries an UDL of 25 KN/m including self weight. The compression flange of beam is adequately restrained check the section for shear and deflection if f_y= 250 N/mm^2, E = 2x 10^5 N/mm^2.

17. Design a simply supported beam of span 5 m carrying RCC floor slab capable of providing lateral restraint to the top compression flange. Imposed load is 15 KN/m and dead load is 20 KN/m. Yield strength of steel is 250 Mpa.

18. A Pratt truss of span 12m and pitch is 30^0, carries AC sheet roofing. The trusses are 3m apart. The design wind pressure may be assumed as 1200 N/m^2. Determine the a) Dead Load
b) Live Load
c) Wind load at various panel points of truss.