C09-C-**602**

3721

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL-2019

DCE - SIXTHSEMESTEREXAMINATION

STEEL STRUCTURES

Time: 3 Hours Max.Marks:80

Reference books to be allowed:

1) Steel Code IS 800-2007
2) Steel Tables
3) Extracts from IS 875-1987 for wind load calculation.

PART-A

3x10=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.

1) List any three physical properties and three mechanical properties of steel.
2) Draw the cross section of fillet weld showing different components.
3) What is meant by shear lag?
4) Calculate the design tensile strength of ISA 90x60x8mm in tension due to yielding of gross cross section. Assume yield stress of steel equal to 300 N^2/mm.
5) State any six forms of compression members.
6) Draw the sectional elevation of slab base showing various components.
7) Distinguish between laterally restrained and unrestrained beams.
8) Name any three types of web stiffeners in plate girders.
9) What are the component parts of the poof truss?
10) Calculate live load per 'square metre' of plan area on a sloping roof having a roofing angle 30°.

PART-B

5x10=50M

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

11) An angle ISA 125x95x10mm carrying an axial tensile load of 400kN is to be connected to a gusset plate of 10mm thick through its longer leg using side fillet welds. Design the welded joing. The ultimate shear stress in the weld is 410 N/mm^2 . Assume connections are made at site.

12) Find the Design strength of a single angle tension member ISA 100x75x8 mm connected to 10 mm thick gusset plate using fillet weld. Take length of connection L_C as 170 mm. Assume fy = 300 Mp_a and f_u =440Mp_a.

13) Determine the design compressive strength of single ISHB 300 @ 630 N/m when it is used as column of 6 m height with both of its ends are restrained against translation but free to rotate. Assume yield stress of steel (F_y) = 250 Mp_a.

14) Design a single angle discontinouus strut of length 2.50 m to carry an axial compression 120 kN. Assume Gusset fixity as rigid and longer leg is connected to gusset plate using fillet weld. Take f_y = 250Mp_a.

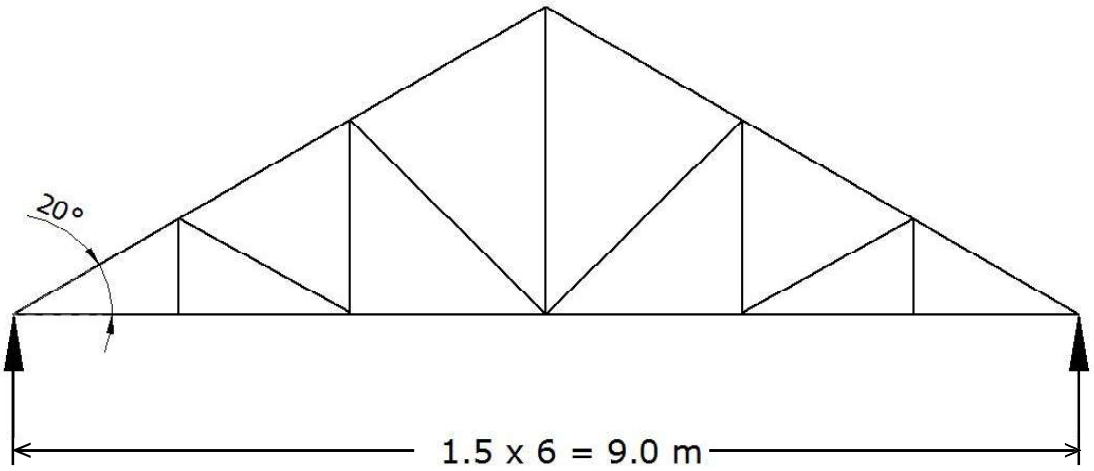
15) a) Draw the elevation of 'Lacing' and 'batten system' of built-up-column. 4M

b) Determine the thickness of slab base of size 320x320 mm is provided below a steel column carrying a factored load of 900kN. The projection of base plate from column in both directions is 35mm. Take f_y =250 Mp_a.

16) Determine design strength in bending and shear of a laterally supported cantilever beam ISLB 400 @ 569 N/m. Take f_y =300N/mm^2.

17) A Rolled Steel I-section of a simply supprted beam of span 5.5m subjected to factored B.M of 170 kN-m and factored S.F of 125 kN. Check the adequacy of the beam for bending and shear. Assume Compression flange of the beam is laterally restrained . Take f_y =250 N/mm^2.

18) A Howe truss of span 9.0 m and pitch 20^0 carries AC sheet roofing. The trusses are 4.0m apart. The design wind pressure is 2000 N/m^2. Determine 'Live Load' and "Wind Load' at various nodal points of the truss. Assume eaves height 7.0m and 'Normal' permeability



* * *