Reg. No. : | | | | | | | | | | |

Question Paper Code: 52262

M.E. DEGREE EXAMINATION, NOV 2016

Second Semester

Structural Engineering

15PSE202 - STEEL STRUCTURES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

(Relevant IS codes are permitted)

PART A - (5 x 1 = 5 Marks)

1. The effective length of a compression member of length *L* held in position and restrained in direction at one end and effectively restrained in direction but not held in position at the other end, is

   (a) *L* (b) 0.67 *L* (c) 0.85 *L* (d) 1.5 *L*

2. A fillet weld may be termed as

   (a) mitre weld (b) concave weld (c) convex weld (d) all the above

3. In plastic analysis, the shape factor for circular sections, is

   (a) 1.5 (b) 1.6 (c) 1.697 (d) None of these

4. In plastic analysis, the shape factor for circular section is

   (a) 1.5 (b) 1.6 (c) 1.697 (d) 2.1

5. The deflection of beams may be decreased by

   (a) Increasing the depth of beam (b) Increasing the span
   (c) Decreasing the depth of beam (d) Decreasing the span

PART B - (5 x 3 = 15 Marks)

6. What is meant by a gable wind girder?

7. Why does buckling of web occur in beams?

8. What are the methods available for the analysis of roof trusses?

9. List the special consideration required to be full filled while attempting to a plastic design.

10. Write about lateral buckling with a neat sketch.

PART C - (5 x 16 = 80 Marks)

11. (a) Draw neat sketch and briefly explain about major components of an industrial building. (16)

Or

(b) A column ISHB 350 @ 66.1 *N/m* carries an axial compressive factored load of 1700 *kN*. Design a suitable bolted gusset base. The base rests on M15 grade of concrete pedestral. Use 24mm diameter bolts of grade 4.6 for making connections. (16)

12. (a) (i) Calculate number of bolts required to transfer a factored axial force of 100 *kN* through a bolted connection using 12 *mm* bolts in single shear with plate thickness of 8 *mm*. (8)

(ii) Differentiate between fillet weld and butt welded joints. (8)

Or

(b) Design stiffened seat connections to connect the ISMB500 transferring a load of 260KN to an ISHB300 @ 577 N/m. (16)

13. (a) Design a roof truss for an industrial building with 25 *m* span and 120 *m* long. The roofing is galvanized iron sheeting. The basic wind speed is 50 *m/s* and terrain is open industrial area and building is class *A* building. The building clear height at the eaves is 9 *m*. (16)

Or

(b) Briefly explain about what are the components should considered while design of industrial building. (16)

14. (a) Determine the shape factor for the following sections (i) Solid rectangular section (ii) Hollow circular section. (16)

Or

(b) Enumerate the factors on which fully plastic moment is dependent. Discuss influence of shear force on fully plastic. Moment of a beam of rectangular section. (16)

15. (a) (i) Explain the design procedure for flexural members for light gauge steel section. (8)

(ii) Brief wall studs. (8)

Or

(b) A simply supported beam of effective span length of 7 m is laterally supported throughout. It carries an uniformly distributed load of 45 *kN/m* (including self-weight). Design the appropriate light gauge steel section as per requirement. (16)

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