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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov/Dec - 2016**

**Subject Title: DESIGN OF STEEL STRUCTURES Time : 3 hours**

**Subject Code: 09CE219/12CE223/CE252 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. The plastic section modulus of rectangular section is ………………….

2. Suitable section recommended to avoid local buckling is ………………..

3. The partial safety factor for the material of bolt is ………………….

4. High strength bolts are designed on the basis of …………………..

5. A beam section is selected and provided on the basis of ……………………

6. Purlins are designed as ……………… beams.

7. The thickness of the gusset plate should not be less than ……………

8. The design strength of tension member is governed in ultimate limit state by

……………………………

9. Effective length of column with one end effectively held in position and restrained against rotation but not held in position at the other end is ………………..

10. Ratio of effective length to radius of gyration is ……………….

**PART – B (5 x 3 = 15 MARKS)**

11. Why plastic or compact sections are preferred for compression members?

12. What is lateral torsional buckling of beams?

13. Define Block shear.

14. What do you mean by Buckling?

15. Describe the term Pitch.

**PART – C (5 x 15 = 75 MARKS)**

16. Explain the loads to be considered for the analysis of steel structures as per the codal provisions.

(OR)

17. Classify the cross sections of steel sections according to local buckling and explain the characteristics with neat sketches.

18. A tie member consisting of an ISA 80 x 50 x 8mm is welded to a 12mm thick gusset plate at site. Design welds to transmit load equal to the design strength of the member.

(OR)

19. Design Joint of a roof truss as shown in figure. The members are connected with 16mm diameter bolts of grade 4.6 and the gusset plate of 12mm thick.

180kN

225kN

75kN

110kN

20. Determine the design bending strength of ISLB 350 @486N/m beam of span 3m. Assume the beam is laterally supported.

(OR)

21. Design an I section purlin for an Industrial building for the following data.

Span of truss – 12m

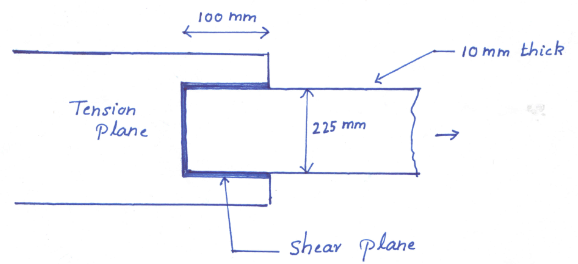
Spacing of truss – 6m

Spacing of Purlin – 1.5m

Weight of GI sheet – 130N/mm2

Wind Pressure – 2 kN/m2

Use Fe410 grade steel

22. Determine the block shear strength of welded member as shown in figure. Steel is of grade Fe 410.

(OR)

23. Compute the tensile strength of an angle section ISA 150 x 115 x 8mm of Fe 410 grade steel connected with gusset plate.

24. Design a column to support a factored load of 1050kN. Effective length of column is 7m with respect to z-axis and 5m with respect to y-axis.

(OR)

25. Calculate the strength of discontinuous strut of length 3.2m. The strut consists of ISA 100 x 75 x 8mm with long legs connected and placed with 10mm gusset plate.

i) On the opposite side of gusset plate

ii) On the same side of gusset plate