RM19002092

**Registration No:**

**Total Number of Pages : 1**                                                                    **M.TECH**
**M.TECH 2$^{ND}$ SEMESTER (AR 18) REGULAR EXAMINATIONS, APRIL/MAY 2019**
**ADVANCED STEEL STRUCTURES**
**Branch: SE, Subject Code:MSEPE2042**
**Time: 3 Hours**                                                                                **Max Marks : 70**
**PART-A**                                                                              **(10 X 2=20 MARKS)**

**1. Answer the following questions.**
(a)  Differentiate between 'Hinge Support' and 'Plastic hinge' in design of steel structure.
(b)  Explain drift criteria in the analysis and design of steel frames.
(c)  Mention the locations in steel beam, where web splices shall be avoided.
(d)  State the relevance of bracings in the design of steel columns.
(e)  Draw a stress strain curve for mild steel showing salient points.
(f)  How are the strength of weld material and strength of parent material to be joined is related?
(g)  Why a circular column section is generally not preferred in actual practice?
(h)  Why does bolt bearing capacity not often control the design?
(i)  What are the different types of bolted connections?
(j)  What are the various types of strength considerations made in design of tension members?

**PART-B**                                                                              **(5 X 10=50 MARKS)**
**Answer any five questions from the following.**

2.  (a)  Determine the moment carrying capacity & shear strength of a laterally unrestrained ISMB500 [5]
member of length 4m.Yield strength of steel is 250 MPa.
(b) Differentiate between web buckling and web crippling.                                                [5]

3.  (a) Show the residual stress distribution in hot rolled I section and channel section.               [5]
(b) Find the plastic moment of resistance for a propped cantilever of span 5m to carry a safe      [5]
concentrated load of 50 kN at a distance of 3m from the fixed end. Take factored load of 1.7.

4.  (a) Two plates of 16mm thickness are connected in a lap joint by high strength friction grip bolts. [5]
Using two rows of bolts at a pitch of 60 mm, determine the diameter of bolts. Take coefficient of
friction = 0.45.
(b) For what length of pin-ended column of equal legged cross section are bend buckling and twist [5]
buckling equally likely.

5.  (a) A bracket plate is bolted to the flange of column ISHB 300@588 N/m which supports a factored [5]
load of 200kN at a distance 150mm from the face of the column. Design the connection using grade =
4.6 bolt.
(b) Explain briefly the various limit states in the design of steel members. Discuss the basis for the [5]
design by limit state.

6.  (a) Explain the concept of *lateral torsional buckling* and *stability of columns*.
(b) Floor beams are spaced at 3-6m center to center with span of 12 m in a Hall. If the D.L is 3kN/m$^2$ [5]
and L.L is 2kN/m$^2$, develop the loading criterion for Load and Resistance Factor Design.               [5]

7.  (a) If 10m long column has boundary condition on each axis as pinned select the appropriate size of [5]
the column section by LRFD design specifications. Given Dead load and Live load is 50kN and 30kN
respectively.
(b) What do you mean by Moment Magnification Factor? How does it affect the design process?          [5]

8.  Write short notes on :
(a)  Four class of section
(b)  Types of tension members                                                                       [5]
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