

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Backlog), November-December 2015

B. Tech in Civil Engineering, Semester V

Roll No.....

CE 503: STEEL STRUCTURE - I

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units and drawing neat sketches wherever, required are an integral part of the answer.
4. Use of IS: 800, IS: 875 and Steel Table is permitted in examination.
5. Use of non-programmable calculator is permissible.

- Q.1 Objective type multiple choice questions (10 questions @ 1 mark) 10
- i. Two steel parts at right angles are welded with fillet weld of 10 mm size. The throat thickness of the fillet weld should be
A) 7mm B) 10mm C) 12mm D) 5mm
 - ii. The effective height of bearing stiffeners is
A) more than d B) less than d C) $0.7d$ D) $2d$
 - iii. The minimum thickness of plates in a steel stack should be
A) 3mm B) 5mm C) 6mm D) 9mm
 - iv. If the thickness of thinnest outside plate is 10 mm, then the maximum pitch of rivets in tension will be taken as
A) 120 mm B) 160 mm C) 200 mm D) 300 mm
 - v. Minimum pitch of the rivets shall not be less than
A) $1.5d$ B) $2.0d$ C) $2.5d$ D) $3.0d$
 - vi. The difference between gross diameter and nominal diameter for the rivets up to 25 mm diameter is
A) 1.0mm B) 1.5mm C) 2.0mm D) 2.5mm
 - vii. Minimum spacing of vertical stiffeners is limited to
A) $d/4$ B) $d/3$ C) $d/2$ D) $2d/3$
 - viii. The basic wind speed is specified at a height 'h' above mean ground level in an open terrain. The value of 'h' is
A) 10 m B) 20 m C) 25 m D) 50 m
 - ix. Which of the following sections should preferably be used at places where torsion occurs?
A) angle section B) channel section
C) box type section D) any of the above
 - x. Minimum thickness of web in a plate girder, when the plate is accessible and also exposed to weather, is
A) 5 mm B) 6 mm C) 8 mm D) 10 mm

Q.2	Short answer type questions (4 questions @ 2.5 marks)	10
i.	What are the types of failures occur in riveted joint?	
ii.	What is meant by limit state design as per IS standard?	
iii.	Define nominal diameter and gross diameter of bolt.	
iv.	Define effective length of compression member.	
Q.3A	What are the types of load to be account for steel design?	05
Q.3B	What is meant by laterally supported beam?	05
Q.4A	What happens when a single angle with one leg is connected to a gusset plate, which is subjected to an eccentric load?	05
Q.4B	Explain shear lag effect.	05
Q.5A	The main tie of a roof truss consists of ISA 150 X 115 X 8 mm and is connected to a gusset plate by 18 mm diameter rivets. Find out maximum load it can carry.	10
Q.5B	What is web crippling?	05
	OR	
Q.5B	Mention the advantages and disadvantages of welded connections.	05
Q.6A	Design a purlin for a roof truss having the following data: Span of the truss = 6.0m Spacing of truss = 3m c/c Inclination of roof = 30° Spacing of Purlin = 2m c/c Wind pressure = 1.5 kN/m ² Roof coverage = A.C. Sheetting weighing 200 N/m ² Provide a channel section Purlin.	15
Q.6B	What is meant by complete collapse, partial collapse and over complete Collapse in plastic design?	05
	OR	
Q.6B	Name the components of a plate girder.	05
Q.7A	Design a bearing stiffener for a welded plate girder with the following specifications. Web = 1000mm X 6mm thick. Flanges = 2 Nos. of 350X20mm plate on each side. Support reaction = 350kN. Width of the support = 300mm.	15
Q.7B	Design a rolled steel beam section column to carry an axial load 1100 KN. The column is 4 m long and adequately in position but not in direction at both ends.	10
	OR	
Q.7B	Design rolled steel I- sections for a simply supported beam with a clear span of 6m .it carries a UDL of 50 kN/m exclusive of self-weight of the girder .the beam is laterally unsupported.	10