INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

CIVIL ENGINEERING

ASSIGNMENT QUESTIONS

Course Name	:	**STEEL STRUCTURES DESIGN AND DRAWING**
Course Code	:	A60130
Class	:	III - B. Tech
Branch	:	Civil Engineering
Year	:	2017 – 2018
Course Coordinator	:	Mr. B. Suresh, Assistant Professor, Department of Civil Engineering
Course Faculty	:	Mr. B. Suresh, Assistant Professor, Department of Civil Engineering Mr. G. Anil Kumar, Assistant Professor, Department of Civil Engineering

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT –I **INTRODUCTION**		
1	What are the factors that will govern the structural design?.	Understand	1
2	Which type of steel is most commonly used in general construction? Why?	Remember	1
3	State the physical and mechanical properties of steel as a structural material.	Understand	1
4	What are the structural elements of a building?	Understand	1
5	What are the various types of structural steel sections?	Understand	1
6	Explain about the loads to be considered in the Limit State design of steel structures.	Understand	1
7	Briefly explain the possible limit states that are considered in the limit state method of design of steel structures.	Understand	2
8	Write short notes on general stability, stability against overturning and sway stability.	Remember	2
9	What are the various steps involved in the construction of steel structures? [3 Marks]	Understand	2
10	Briefly explain the various stability checks considered by the IS code.	Understand	2
	UNIT-II **DESIGN OF TENSION MEMBERS**		
1	Define Tension members.	Understand	4
2	What are the types of tension members?	Understand	4
3	What is net selection area?	Remember	4
4	Write short notes on lug angles.	Remember	4
5	How is net effective area of a single angle used as tension member calculated?	Understand	5

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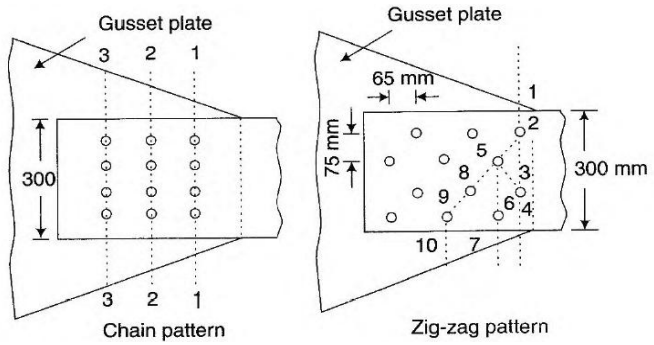
1. 6	A 300 ISF 14 mm of grade Fe410 is used as a tension member in a lattice girder. It is connected to a 18 mm thick gusset plate by 18 mm diameter bolts of grade 4.6 Calculate the effective net area of the member, if (a) Chain bolting is done as shown in Figure 1. [2.5 marks] (b) Zig-zag bolting is done as shown in Figure 1. [2.5 marks]  	Remember	5
7	Explain how the design strength of a tension member is determined subjected to axial tension.	Understand	5
8	Write the procedure for the design of tension member subjected to both bending and axial tension.	Understand	5
9	Design a splice to connect 300 x 200 mm plate with a 300 x 10 mm plate. The design load is 450 kN and the bolts are 20 mm black bolts fabricated in the shop.	Remember	5
10	What are the remembers of tension members? Give some examples	Remember	5
	UNIT-III **DESIGN OF COMPRESSION MEMBERS**		
1	Define Compression member	Understand	5
2	State four standard conditions of support conditions of compression members and state corresponding expressions for effective length	understand	5
3	Name the modes of failure in a column.	understand	5
4	Define Slenderness ratio. Classify the columns according to the slenderness ratios.	Understand	6
5	State the assumptions that made in Euler's theory	Understand	6
6	Design a built-up column of two channels placed toe to toe. The effective length of the columns is 5m. The column carries an axial load of 2000 kN. Also design the lacing system.	Remember	6
7	Design of a gusseted base for a column ISWB 450, 5.5 m long with cover plates of 400 mm x 20 mm on both faces. The column carries a factored load of 4000 kN. M10 plain concrete will be provided under the base plate. Sketch the column base neatly.	Remember	6
8	Write short notes on, (a) Buckling class of cross-section (b) Slenderness ratio	Understand	6
9	Explain the step by step procedure for finding the load carrying capacity of a compression member.	Understand	6
10	Design a compression member of two channels placed toe-to-toe. The length of the compression member is 8 m and carries a load of 1000 kN.The width over the backs of channels is 450 mm. the channels are connected by battens, sketch the c/s of the column.	Remember	6

S. No	Question	Blooms Taxonomy Level	Course Outcome
	UNIT-IV **DESIGN OF PLATE GIRDERS**		
1	Name the components of a plate girder.	Understand	9
2	Where are the plate girders used?	Remember	9
3	What is the expression for the economical depth of a plate girder?	Remember	9
4	Mention the basic design assumptions of a plate girder.	Understand	9
5	Why intermediate stiffeners are required for plate girders?	Understand	9
6	Explain the various types of roof trusses with neat sketches.	Understand	9
7	Explain briefly the various loads to be considered for the designing of roof trusses.	Understand	9
8	Write short notes on load combinations which are to be considered in the design of cladding and trusses.	Remember	9
9	Give briefly the design steps to be followed in the design of a roof truss [Page Number. 770, S.K. Duggal, 2nd edition]	Remember	9
10	Design a steel roof truss to suit the following data: Span of the truss = 10 m Type of truss = Fan-type Roof cover = Galvanised corrugated (GC) sheeting Materials : Rolled steel angles Spacing of roof trusses = 4.5 m Wind pressure Pd = 1.0 kN/m^2 Draw the elevation of the roof truss and the details of joints [Page Number 320; N Krishna Raju, Structural Design and drawing, 3rd edition]	Remember	9
	UNIT-V **DESIGN OF ROOF TRUSSES**		
1	Name the types of roofing systems and where the steel roof trusses are used?	Understand	10
2	Mention the advantages of a roof truss.	understand	10
3	Sketch the various types of roof truss.	Remember	10
4	What is the factor that is considered in the roof truss and why?	Understand	10
5	How are the roof trusses classified according to the pitch?	Understand	10
6	Explain the various types of roof trusses with neat sketches.	Understand	10
7	Explain briefly the various loads to be considered for the designing of roof trusses.	Understand	10
8	Write short notes on load combinations which are to be considered in the design of cladding and trusses.	Remember	11
9	Give briefly the design steps to be followed in the design of a roof truss [Page Number. 770, S.K. Duggal, 2nd edition]	Remember	11
10	Design a steel roof truss to suit the following data: Span of the truss = 10 m Type of truss = Fan-type Roof cover = Galvanised corrugated (GC) sheeting Materials : Rolled steel angles Spacing of roof trusses = 4.5 m Wind pressure Pd = 1.0 kN/m^2 Draw the elevation of the roof truss and the details of joints [Page Number 320; N Krishna Raju, Structural Design and drawing, 3rd edition]	Remember	11

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