



End Semester Examination – Nov/Dec – 2016

Code : **14CE2037**
Sub. Name : **Advanced Design of steel structures**

Semester : **VII / ODD**
Duration : **3hrs**
Max. marks : **100**

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	An ISLB 300 @ 369.8 N/m transmits an end reaction of 300 kN, under factored load, to the web of ISMB 450 @ 710.2 N/m. Design a bolted framed connection. Steel is of grade Fe 410 and bolts are of grade 4.6. Assume relevant data if required.	CO1	20
(OR)				
2.	a.	Write the step by step procedure for the design of bolted connection under axial load condition.	CO1	10
	b.	Sketch a neat diagram of Fink type truss and mark the parts of the roof truss.	CO 3	5
	c.	List out the advantages of Bolted connection	CO1	3
	d.	Define Bolt Value	CO1	2
3.	a.	Design a stiffened seat connection for ISMB 350 @ 514 N/m transmitting an end reaction of 315 kN due to factored loads to a column section ISHB 300 @ 576.8N/m. The steel is of grade FE 410 and bolts of grade 4.6. Assume relevant data if required.	CO1	20
(OR)				
4.	a.	Write the step by step design procedure for unstiffened seat connection with a neat sketch.	CO1	10
	b.	Write short note on Bracings of industrial Building frames with neat sketches.	CO 3	5
	c.	Write short note on Structural steel and its properties.	CO 3	5
5.	a.	Design a purlin for an industrial building of following data. c/c spacing of truss - 7 m Span of the truss -15 m Self-weight of the purlin – 318 N/m D.L due to self-weight – 171 N/m ² Live Load - 3 kN/m ² The building is located in industrial area of Allahabad and both ends of the truss are hinged. Assume relevant data if required.	CO 2	20
(OR)				
6.	a.	Explain the major components of an industrial building with the help of neat sketches.	CO 2	10
	b.	Briefly explain web buckling with neat sketches	CO 2	6
	c.	Differentiate web buckling and web crippling	CO 2	4
7.	a.	Write the step by step procedure for analysis of lattice Tower subjected to wind load.	CO 3	10
	b.	Briefly explain steel Chimney , types and various components of self supporting chimney with neat sketches.	CO 3	10
(OR)				
8.	a.	Write the codal provisions for composite construction of structural members in steel and concrete.	CO 3	12

	b.	Write short note on shear connectors .	CO 3	8
		<u>Compulsory:</u>		
9.	a.	Design a simply supported composite beam with 10 m span and spaced at 3 m. The thickness of the slab is 125 mm. The floor is to carry an imposed load of 3 kN/m ² and floor finish load of 0.5 kN/m ² . Take construction load as 0.75 kN/m ² . $f_{ck} = 30 \text{ N/mm}^2$ and $f_y = 250 \text{ N/mm}^2$. Assume relevant data if required.	CO 2	20

Course Outcome:

Students at the end of the course will be able to:

CO1: Classify different types of bolted and welded joints

CO 2: Design the steel beam and columns

CO3: Plan, analyse and design the industrial building

ALL THE BEST