

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

October 2024 Supplementary Examinations

Programme: B.E.

Semester: VI

Branch: Civil Engineering

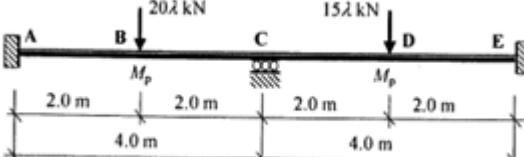
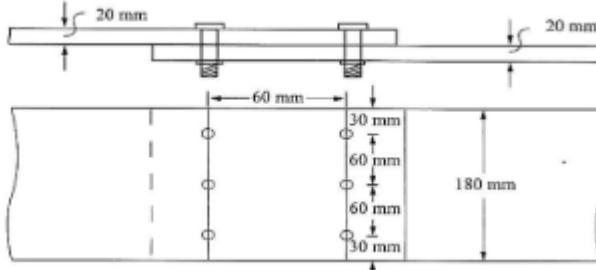
Duration: 3 hrs.

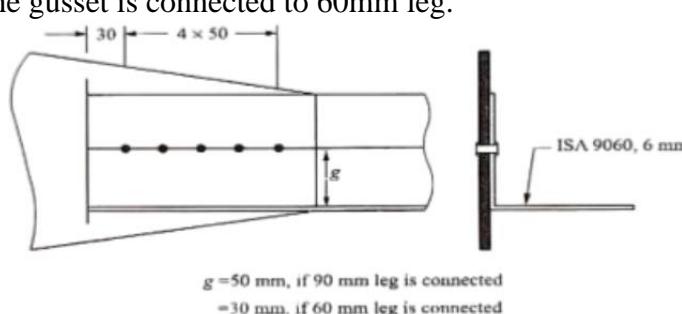
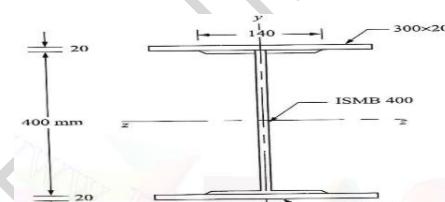
Course Code: 22CV6PCDSS

Max Marks: 100

Course: Design of Steel Structural Elements

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
 2. Missing data, if any, may be suitably assumed.
 3. Use of IS-800-2007, SP(6)-1 or steel table is permitted.
 4. Draw neat sketches wherever necessary.

			CO	PO	Marks
Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.		UNIT – I			
	1	a) Analyse the given continues beam and determine the required value of M_p to ensure a minimum load factor $\lambda=1.7$	CO 1	PO2	14
					
		b) Explain the limitations of working stress method?	CO 1	PO1	6
			UNIT – II		
S	2	a) Find the efficiency of the lap joint shown in below fig. with the following data: M20 bolts of grade 4.6 and Fe410 plates are used	CO 1	PO2	14
					
		b) Enumerate the advantages and disadvantages of bolted connections?	CO 1	PO1	06
			OR		
S	3	a) A tie member of a roof truss consists of 2 ISA 100x75x8mm. The angles are connected to either side of a 10mm gusset plate and the member is subjected to a working pull of 300 kN. Design the welded connection. Assume connections are made in the workshop.	CO 2	PO2	16

	b)	List the merits and demerits of welded connections?	CO 1	PO1	4
UNIT - III					
4	a)	i) Define tension member splice. ii) Explain shear lag effect	CO 2	PO3	6
	b)	A single unequal angle ISA 90mmx60mmx6mm is connected to a 10mm gusset plate at the ends with 5 nos. of 16mm bolts to transfer tension. Determine the design tensile strength of the angle i) if the gusset is connected to 90mm leg. ii) if the gusset is connected to 60mm leg.  $g = 50 \text{ mm, if 90 mm leg is connected}$ $= 30 \text{ mm, if 60 mm leg is connected}$	CO 2	PO3	14
UNIT - IV					
5	a)	i) Define slenderness ratio of compression member ii) Define effective length of a column.	CO 2	PO3	6
	b)	Determine the load carrying capacity of the welded built up column section shown in the fig. if its actual length is 4.5m. One end of the column may be assumed fixed and other end hinged. The grade steel is Fe 415 	CO 2	PO2	14
OR					
6	a)	Explain different modes of buckling of compression members.	CO 2	PO3	4
	b)	Design a single angle strut connected to gusset plate to carry 180 kN-factored load. The length of the strut between center-to-center intersections is 3m. Assume 2 bolts are used to connect the member to the gusset.	CO 2	PO2	16
UNIT - V					
7	a)	i) Explain web buckling and web crippling?	CO 2	PO3	4
	b)	Design a simply supported beam of effective span 1.5m carrying a factored concentrated load of 360 kN at mid span .Beam is laterally restrained.	CO 2	PO1	16
