

Model Question Paper- (2021 scheme)

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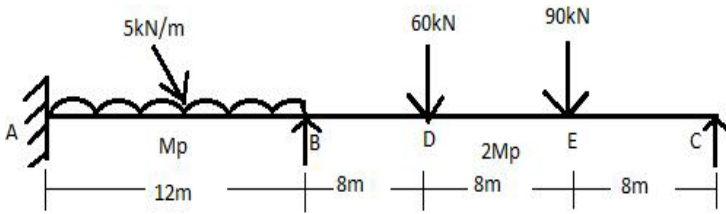
Sixth Semester B.E. Degree Examination DESIGN OF STEEL STRUCTURAL ELEMENTS

21CV63

TIME: 03Hours

Max.Marks:100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02. Use of IS: 800-2007 & steel table is permitted

Questions			*Bloom's Taxonom y Level	Marks
Module-1				
Q.01	a	List the advantages and disadvantages of steel structures.	L2&CO1	10
	b	Distinguish between working stress design and limit state design of steel structure	L2&CO1	10
OR				
Q.02	a	Calculate the shape factor of triangle.	L2&CO1	10
	b	Calculate M_p for the continuous beam shown in figure, Q2b if load factor is 3.2.	L2&CO1	10
 <p style="text-align: center;">Fig : Q2b</p>				
Module-2				
Q.03	a	Explain the failure modes of bolted connection	L3&CO2	10
	b	Design a bolted connection for a lap joint of plate thickness 16mm and 12mm to carry a factored load of 160kN. Use M_{16} and 4.6 grade bolts.	L3&CO2	10
OR				
Q.04	a	What are the advantages and disadvantages of welded connection?	L3&CO2	10
	b	A tie member of Truss consisting of angle section ISA 65X65X6mm of Fe 410 grade is welded to 8mm gusset plate. Design a weld to transmit a factored load of 150kN.	L3&CO2	10
Module-3				
Q.05	a	Explain the failure modes of axial loaded column.	L2&CO3	10
	b	Determine the design compressive strength of ISHB300@576.8N/m, Length of column is 3.5m and both ends are pinned.	L2&CO3	10
OR				
Q.06	a	Design a single angle discontinuous strut to carry a factored load of 65kN. The length of strut is 3m, between inter section. It is connected to 12mm thick gusset plate by 20mm diameter, 4.6 grade bolts	L3&CO3	20

Module-4				
Q.07	a	Explain the factors effecting strength of tension members.	L3&CO4	10
	b	Design a tension member to carry factored load of 400kN connected to shorter leg back to back. Length of member is 3m	L2&CO4	10
OR				
Q.08	a	Explain Lug angles and column splices.	L3&CO4	10
	b	Design slab base for a column made of ISHB250@536 N/m to carry axial working load of 520kN. The grade of concrete is M ₂₀ and grade of steel Fe 410	L3&CO4	10
Module-5				
Q.09	a	List the various factor affecting the lateral stability of a beam.	L3&CO5	10
	b	Design a cantilever beam which is casted monolithic into concrete wall and carrying a Dead load of 25kN/m and Live load of 10kN/m. Span of the beam is 5.0m	L3&CO5	10
Q.10	a	Design a purlin on a sloping roof with the Dead load 0.2kN/m ² , Live load 2kN/m ² and wind load of 1kN/m ² (suction). The spacing of purlin is 2.5m c/c and span of 4m. Assume the ends are simply supported and slope of 25°. Use channel section as purlin.	L3&CO5	20