GALGOTIAS UNIVERSITY

ADMISSION NUMBER

School of Engineering

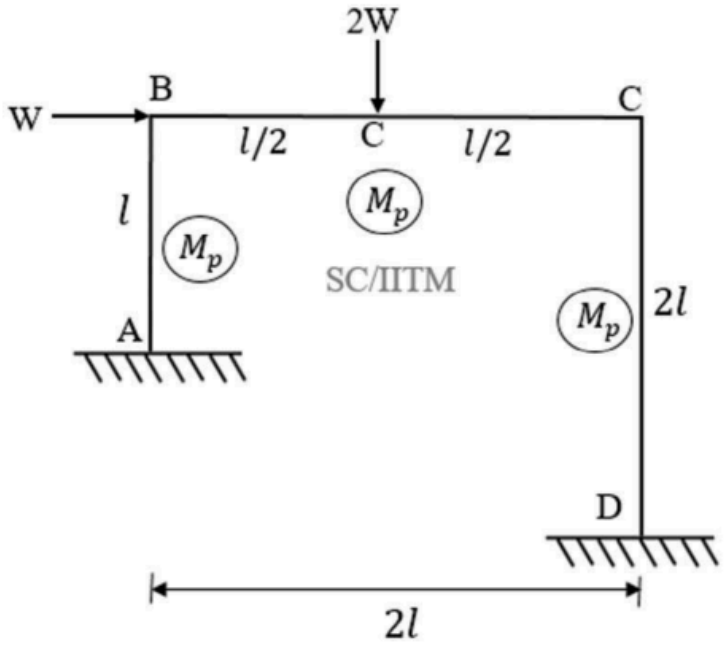
M.Tech Structural Engineering
Semester End Examination - Jun 2024

Duration : 180 Minutes
Max Marks : 100

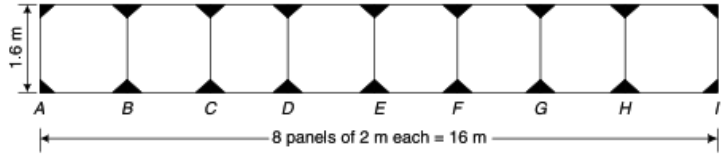
Sem II - G1PC203T - Limit State Design of Steel Structures

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	Name the components of steel roof truss.	K1(2)
2)	Explain the shape factor of triangular section.	K2(4)
3)	Illustrate breech opening in a chimney.	K2(6)
4)	Construct the design procedure for anchor bolts for chimney.	K3(9)
5)	Construct the mechanism for the Fig and Find the true collapse load of the portal frame using the kinematic theorem.	K3(9)



6)	A self-supporting steel chimney is 60 m high and has a diameter 3 m atthe top. Evaluate the thickness of the plate of the chimney. Also design the base plate andthe anchor bolts. The foundation and the riveted joints need not be designed.The horizontal pressure may be assumed as l.50 kN/m2. The bearingstress in cement concrete is 40 N/mm2.	K5(10)

7)	Anaylyze the plastic and elastic analysis.	K4(12)
8)	Determine the Design of a welded plate girder 24 m in span and laterallyrestrained throughout. It has to support a uniform load of 100 kN/m throughoutthe span exclusive of self-weight. Design the girder without intermediatetransverse stiffeners. The steel for the flange and web plates is of grade Fe 410. Yield stress of steel may be assumed to be 250 MPa irrespective of thethickness of plates used. Design the cross section, the end load bearing stiffener and connections.	K5(15)
9)	Determine the principal tie member design of a fink type roof truss for the following data. Design also its connection with a 12 mm thick gusset plate using 20 mm diameter bolts of grade 4.6. Use steel of grade Fe 410. Design tensile force 150 kN (due to D.L and L.L) Design compressive force 40 kN (due to D.L and W.L)	K5(15)
10)	Design a vierendeel girder as shown in Fig. for the follwing data. Purlins will be provided at each node to support roofing.Span of the girder 16 m Panel length 2 m Height of the girder 1.6 m c/c spacing of girders 5 m Roofing material Asbestor cement sheets (dead weight = 171 N/m2) Access to roof not provided Grade of steel Yst240 or Yst310 may be used  (a)	K6(18)