UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: Industrial Structures   **Semester: I**
Program: M.Tech Structural Engineering   **Duration : 03 hrs.**
Course Code: CIVL 7004   **Max. Marks: 100**

Instructions: This is open book examination . Students are allowed to bring hard copy of notes, codes, books and other reference material and use them in examination. Any data required and not provided should be assumed suitably and clearly stated.

	SECTION A		
	(Scan and upload)		(5Q x 4M=20 marks)
S. No.		**Marks**	**CO**
Q 1	Which of the following type of industry is more likely to use a chimney, and why: a. Secondary industry b. Tertiary industry	4	CO1
Q 2	How is the maximum height of a building fixed considering the width of abutting road and the front open space.	4	CO1
Q 3	Why are lifts and escalators not considered as exits.	4	CO1
Q 4	Explain why for calculating wind load in the design of industrial sheds, the sign of internal pressure coefficient is taken same as the sign of external pressure coefficient.	4	CO2
Q 5	While deciding the configuration of panels in design of an industrial roof, the distance between two purlins is kept less than the span of roofing sheet used over it. Why.	4	CO2
	SECTION B		
	(Scan and upload)		(4Q x 10M=40 marks)
Q 6	A rolling mill employs 70 workers to run a total of four machines. Two machines occupy an area of 8x 12 m each, while two machines occupy an area of 4m x 6m each. Two cabins for supervisors and one cabin for manager are also to be provided. Calculate the total area of industrial shed required and suggest a size for the shed, assuming that the span of industrial shed not to exceed 18m, due to width limitation and setback requirements of site. Sketch the layout plan of the shed. Any other data necessary may be assumed and clearly stated.	10	CO1

Q 7	In continuation of Q .6, assuming that columns are spaced at 6m c/c, and GI sheets of 3m span are available, sketch a structural plan for the roof of shed, and calculate the actual area and plan area per panel. Any other data necessary may be assumed and clearly stated.	10	CO1
Q 8	In continuation of Q. 6 and Q. 7, and assuming framed construction, estimate the dead load and live load per panel. Assume the height of columns as 6m and rise of roof above the columns not to exceed 2m. Any other data necessary may be assumed and clearly stated.	10	CO2
Q 9	In continuation of Q .6, 7 and 8, illustrate in sketches how the dead loads and live loads will act on industrial framed roof. Or Assuming a suitable truss, illustrate in sketches how the dead loads and live loads will act on industrial trussed roof.	10	CO2

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SECTION-C

(Scan and upload)   **(2Q x 20M=40 marks)**

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Q 10	A hyperbolic cooling tower 180m high is to be constructed for a power plant where space available is 120m. Generate the governing equations for the top and bottom portions of the cooling tower from the throat and plot the profile of the cooling tower. Or A mobile transmission tower 60 m high is to be built in Dehradun city, where the terrain can be assumed to be of category 3 and topography is flat ground. An antenna disc of diameter 2m is to be attached to the tower at the top on each side. Assuming the width of side of tower at the top to be 3 m: a. select a suitable configuration for the tower, b. divide the tower into suitable determinate panels, c. calculate the wind load acting on the panel points of the tower, and show it in a sketch.	20	CO3
Q 11	A self supporting steel chimney having a height of 60m is to be constructed at Chennai. The chimney has a brick lining 150 mm thick . Assume flat ground and terrain category 3. Assume unit weight of lining= 15KN/m^3. Any other data considered necessary may be assumed and clearly stated. Divide the chimney into suitable panel heights, and check upto what height from the top, 6mm thick plates can be used.	20	CO-3