Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U1907

M.E. DEGREE EXAMINATION, APRIL 2024

Professional Elective

Structural Engineering

21PSE507 – DESIGN OF STEEL CONCRETE COMPOSITES STRUCTURES

(Regulations 2021)

(Use of IS 11384 Code books are permitted)

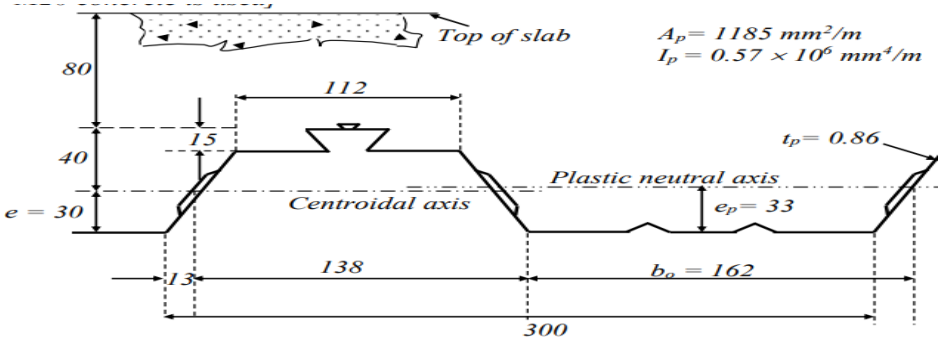
Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1.	(a)	Determine a profiled deck slab composite section's ultimate moment capacity in accordance with IS code.	CO1- App	(20)
		Or		
	(b)	Determine the expression for a composite section's ultimate moment capacity. i. N.A is located within the Slab ii. N.A is located within the steel beam's flange iii. N.A is located within the Web of steel beams	CO1- App	(20)
2.	(a)	Demonstrate the design procedure to assess the plastic resistance & non – dimensional slenderness parameter for composite columns.	CO2- App	(20)
		Or		
	(b)	Interpret the design procedure to determine the ultimate moment capacity of a composite beam section with the provision of profile sheeting and compare with the ultimate capacity of IS11384 provision.	CO2- App	(20)
3.	(a)	Design the shear connection at the interface of a composite RC slab and steel beam for the following data: Span of the beam =9m ; Spacing of the beam = 3m ;Thickness of slab= 100mm; Steel beam section = ISHB 400; Concrete strength = 25MPa.	CO5- Ana	(20)
		Or		

(b) Analyze the continuous composite profiled deck slab with spans of 3.5 m. The cross section of the profiled sheeting is shown in Fig. The slab is propped at the centre during construction stage. [γap = 1.15, M20 concrete is used]. Check shear resistance of the profiled deck slab. CO5- Ana (20)



4. (a) Interpret the common construction methods in composite design in respect of buildings. CO4-Ana (20)

Or

(b) Explain the general design principles of composite box girder bridges. CO4- Ana (20)

5. (a) Investigate on steel concrete composite construction in buildings with case study. CO6-Eva (20)

Or

(b) Evaluate the factors to be considered while the designing the composite structure under seismic loads. Also explain the seismic behavior of composite beams and columns. CO6-Eva (20)