GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (Second Semester) Examinations, May – 2024

MPESE2033 - Composite Structures

(Structural Engineering)

Time: 3 Hrs   Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A   **(2 x 10 = 20 Marks)**

Q.1. Answer all questions

		CO#	Blooms Level
a.	Comment on the mechanism of load resistance in composite columns.	CO1	K2
b.	Write any three applications of steel-concrete-steel sandwich construction.	CO1	K2
c.	Write note on selection of effective breadth of composite beam.	CO1	K2
d.	Explain the typical cross-sections of composite column with figure.	CO2	K1
e.	What are the properties of shear connectors?	CO2	K2
f.	What are the types of composite truss members?	CO3	K1
g.	Explain the advantages of composite girder bridges.	CO3	K2
h.	Explain the significance of considering the seismic behavior of composite structures.	CO3	K2
i.	Give examples for fiber material .	CO4	K3
j.	Mention important matrix materials.	CO4	K1

PART – B   **(10 x 5=50 Marks)**

Answer *ANY FIVE* questions

			Marks	CO#	Blooms Level
2.	a.	What is the difference between RCC and steel-concrete composite construction?	5	CO1	K3
	b.	Explain the functions of shear connectors in composite construction.	5	CO1	K3
3		Explain the different types of connectors used in steel- concrete- steel sandwich construction and the advantages of steel- concrete- steel sandwich construction	10	CO1	K3
4.	a.	Explain composite action in beams, types of composite beams and its advantages.	5	CO2	K2
	b.	Write detailed design steps for columns with axial load and uniaxial bending.	5	CO2	K2
5.	a.	Check the adequacy of the concrete encased composite column of dimensions 350 x 350 x 3000 mm with axial load =1200 kN. Bending Moment about X- axis =160 kN-m, Bending Moment about Y- axis=140 kN-m Use M-30 concrete and Fe-415 steel.	10	CO2	K3

y

350 mm

25 mm

x

350 mm

ISHB 250

4-14 mm Φ bars
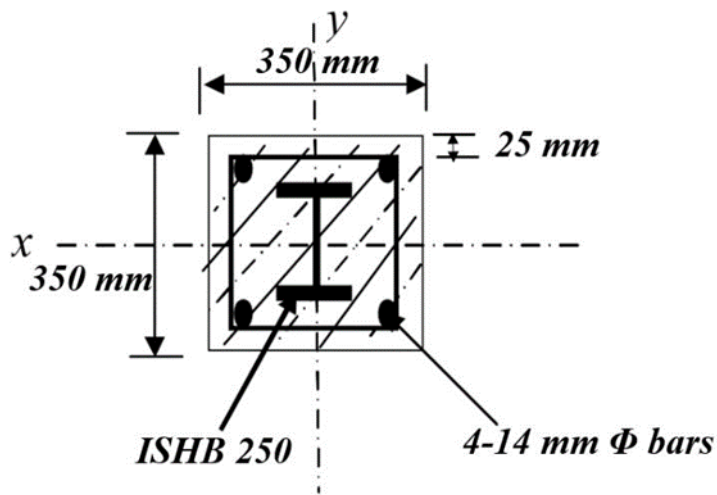
6.	Check the adequacy of the composite beam at composite stage having a span 12 m, spacing of the beams= 4 m, thickness of slab = 150 mm. Floor is carrying an imposed load of 3.2 kN/ 2, partition load of 1.25 kN/ 2 and floor finish of 0.5 kN/ 2.	10	CO3	K2
7.a.	Explain the procedure for the design of composite box girder bridges.	5	CO4	K2
b.	Explain the seismic behavior of composite slab and composite connections.	5	CO4	K3
8. a.	Explain the role of steel decking in composite construction,	5	CO4	K2
b.	Explain the steel decking applications and advantages with suitable sketches.	5	CO4	K3

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