

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SECOND SEMESTER M. TECH DEGREE EXAMINATION

Civil Engineering

(Structural Engineering and Construction Management)

04 CE 7401 – Design of Steel-Concrete Composite Structures

Max. Marks : 60

(Use of Eurocodes and IS Codes are permitted)

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. What is the essential difference between RCC and steel-concrete composite structures?
2. Write any one application of steel concrete steel sandwich construction.
3. How the effective breadth of the composite beam is considered? Why?
4. What are the major factors considered in the design of a composite column as per Eurocode.
5. Explain the effect of shear connection on bending stress and shear stress.
6. How the load transfer taken place in fixed shear connections
7. Draw and explain interaction curve for uniaxial bending.
8. Explain the role of steel decking in composite deck slab.

PART B

Each question carries 6 marks

9. List out the advantages and disadvantages of composite construction practice.

OR

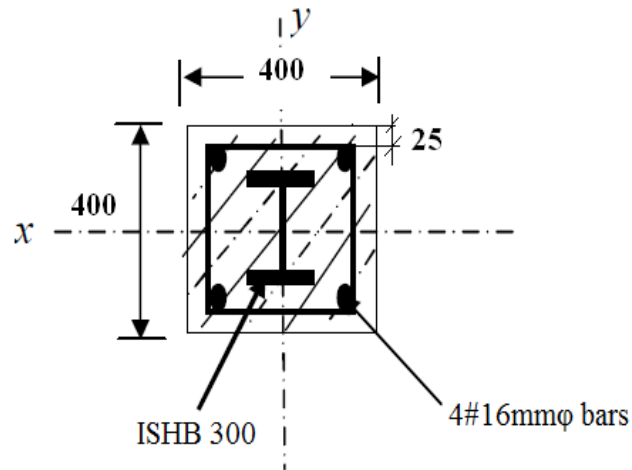
10. Explain calculation of creep in linear elastic analysis of composite sections.
11. Briefly explain steel-concrete-steel sandwich system and their applications.

OR

12. Explain the elastic behavior of composite beam.
13. Check the adequacy of the composite beam at construction stage having a span 8 m, spacing of the beams =3 m ,thickness of slab = 150 mm . Floor is carrying a imposed load of 3.0 kN/ m² , partition load of 1.5 KN/m² and a floor finish of 0.5 KN/m²

OR

14. Write the steps to find the plastic resistant moment of a composite cross-section.
15. Design the following column of dimension 400 × 400 × 3200 mm with axial load= 1850 kN and bending moment about X axis =200 kNm. Use M-30 concrete and Fe 415 steel.



OR

16. Describe the detailing provisions in the design of composite columns.
17. Draw the bending stress diagram of a composite slab (with the provision of profile sheeting) when the neutral axis is within the concrete slab?

OR

18. Design the bottom chord member of a composite truss of span 12 m with the following data
truss spacing= 2.8 m, thickness of the slab =150 mm, profile thickness =75 mm, self weight
of deck slab=3.0 KN/m² ,Top chord restrained at 1.6 m c/c, use M-20 concrete and Fe 250
steel.
 19. Elaborate the step by step procedure for the design of box girder composite bridge
- OR**
20. Briefly explain the seismic behavior of composite column.