

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER M.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022**STRUCTURAL ENGINEERING AND CONSTRUCTION MANAGEMENT****(2020 Scheme)****Course Code: 20CESCT211****Course Name: Design of Steel – Concrete Composite Structures****Max. Marks: 60****Duration: 3 Hours***Use of Euro code extract , IS Codes and Steel table are permitted***PART A***(Answer all questions. Each question carries 3 marks)*

1. Explain the role of steel decking in composite deck slab.
2. Summarize recent developments in composite construction.
3. Discuss the loads to be considered for the design of composite beams.
4. Explain the significance of European buckling curves.
5. Explain the advantages of composite truss.
6. Discuss the loads to be considered for the design of composite truss.
7. Explain how composite construction proves to be more advantageous in the case of bridges.
8. Briefly explain the seismic behavior of composite columns.

PART B*(Answer one full question from each module, each question carries 6 marks)***MODULE I**

9. Explain the different elements of composite construction. (6)

OR

10. Explain the elastic behavior of composite beam with respect to no interaction and full interaction. (6)

MODULE II

11. Write short notes on steel-concrete-steel sandwich system and their applications. (6)

OR

12. List the advantages of J hook connectors over head stud connectors. (6)

MODULE III

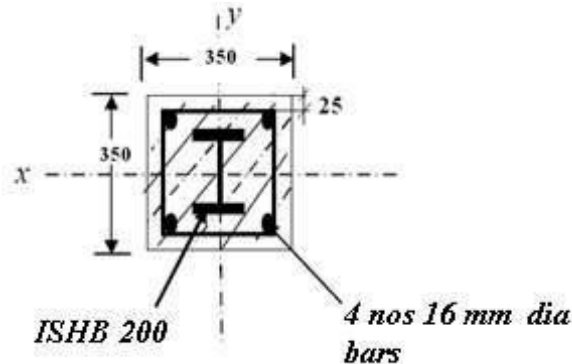
13. Check the adequacy of the composite beam at construction stage having a span 14 m, spacing of the beams is 3.5 m, thickness of slab is 150 mm. Floor is carrying a imposed load of 2.75 kN/m^2 , partition load of 1.5 kN/m^2 and a floor finish of 0.5 kN/m^2 . (6)

OR

14. Check the adequacy of the composite beam at ultimate stage having a span 12 m, spacing of the beams = 3 m, thickness of slab is 140 mm. Floor has to carry an imposed load of 2.5 kN/m^2 , partition load of 1.5 kN/m^2 and a floor finish of 0.5 kN/m^2 . (6)

MODULE IV

15. Design the following column of dimension $350 \times 350 \times 3200 \text{ mm}$ with axial load of 1500 kN and B.M about X axis is 160 kN-m, use M30 concrete, Fe 415 steel. (6)



OR

16. Write short notes on the following (6)
- Advantages of composite columns.
 - Fire resistance of composite columns.

MODULE V

17. Explain the design considerations suggested by Euro code 4 for the design of composite trusses. (6)

OR

18. Design the top chord member of a composite truss of span 13 m with the following data truss spacing = 2.7 m, thickness of the slab = 150 mm, profile thickness = 75 (6)

mm, self weight of deck slab=3.0 kN/m², Top chord restrained at 1.75 m c/c, use M20 concrete and Fe 250 steel.

MODULE VI

19. Explain the structural behavior of composite box Girder Bridge. (6)

OR

20. Briefly explain the seismic behavior of composite column, beam and slab. (6)
