

Reg. No. :

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

Question Paper Code: 52601

M.E. DEGREE EXAMINATION, MAY 2017

Elective

Structural Engineering

15PSE512 – DESIGN OF STEEL CONCRETE COMPOSITE STRUCTURES

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

- Ties are generally _____ shaped.
 - V shaped
 - U shaped
 - open ended
 - both (a) and (c)
- The redistribution reduces the support moments, increasing the deflection are known as
 - pattern loading effect
 - shake down effect
 - both (a) and (b)
 - none of these
- As per IS 11384-1985, the spacing between connectors should not be greater than _____ times slab thickness.
 - 4
 - 6
 - 3
 - 5
- The depth of the box girder can be assumed to
 - 1/20 and 1/25
 - 1/15 and 1/20
 - 1/25 and 1/30
 - 1/10 and 1/15
- Mechanical interlocks are used to prevent
 - shear bond failure
 - flexure failure
 - both (a) and (b)
 - none of these

PART B - (5 x 3 = 15 Marks)

6. Write the expression for modular ratio.
7. What are composite Trusses?
8. Define Strength of Connector.
9. Draw the idealized load – slip diagram?
10. What types of composite columns are efficient in seismic region?

PART C - (5 x 16 = 80 Marks)

11. (a) Explain the theory and design principles of composite constructions. (16)

Or

- (b) Discuss the properties of material used in steel – concrete composite construction. (16)

12. (a) Discuss in detail about the failure modes of steel concrete steel sandwich construction. (16)

Or

- (b) Derive the expression for ultimate moment of resistance of composite beams. (16)

13. (a) Discuss in detail the various types of shear connections with neat sketches. (16)

Or

- (b) Explain the characteristic strength of shear connectors. (16)

14. (a) Explain the structural behavior of box girder bridge and its suitability for the composite constructions. (16)

Or

- (b) Explain in detail the behavior of box girder bridges. (16)

15. (a) Explain the seismic behavior of composite beams with an example. (16)

Or

- (b) Illustrate the case studies in steel – concrete composite construction in buildings. (16)