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

Question Paper Code: 52639

M.E. DEGREE EXAMINATION, NOV 2016

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)

1. Ties are generally _____ shaped.

   (a) V shaped (b) U shaped
   (c) open ended (d) both (a) and (c)

2. The redistribution reduces the support moments, increasing the deflection are known as

   (a) pattern loading effect (b) shake down effect
   (c) both (a) and (b) (d) none of these

3. As per IS 11384-1985, the spacing between connectors should not be greater than_____ times slab thickness.

   (a) 4 (b) 6 (c) 3 (d) 5

4. The depth of the box girder can be assumed to

   (a) l/20 and l/25 (b) l/15 and l/20
   (c) l/25 and l/30 (d) l/10 and l/15

5. Mechanical interlocks are used to prevent

   (a) shear bond failure (b) flexure failure
   (c) both (a) and (b) (d) none of these

PART B - (5 x 3 = 15 Marks)

6. What are the types of composite construction?

7. What are the main advantages of using composite material constructions?

8. Define shear connector.

9. What are the forms of box Girder Bridge?

10. Why strong columns are preferred in seismic prone region?

PART C - (5 x 16 = 80 Marks)

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

Or

(b) Discuss in detail with neat sketches the various types of composite construction. (16)

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

Or

(b) Elaborate the design procedure for composite trusses in step – by – step. (16)

13. (a) Explain in detail about the various types of connections with the help of sketch. Also discuss the load bearing mechanism of the shear connectors. (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 or box girder bridges. (16)

15. (a) Discuss a case study about the steel concrete composite construction. (16)

Or

(b) Explain the seismic behaviour of composite structures with neat sketch. (16)