S.Y. B.ARCH. SEM-IV (2010 Course) Winter-2017

**SUBJECT: THEORY OF STRUCTURES & BUILDING MATERIALS – IV**

Day: Tuesday
Date: 07-11-2017 W-2017-3251

Time: 10:00 AM TO 1:00 P.M.
Max Marks. 100

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**N.B.**

1) Attempt any **THREE** questions from Section – **I** and any **FOUR** questions from Section – **II.**
2) Answer to both the section should be written in **SEPARATE** answer books.
3) Draw illustrative sketches **WHEREVER** necessary.
4) Use of non programmable calculator is **ALLOWED.**
5) Figures to the right indicate **FULL** marks.
6) Assume suitable data if necessary.

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## SECTION - I

**Q.1** Fixed beam of 15 m span is subjected with two point loads of 8 KN at 3m & 5m from left band support. Determine support moments. Draw S.F.D. & B.M.D. **(20)**

**Q.2** A continuous beam ABCD is hinged at A span AB is 6.5 m long & carries a u.d.l. of 3 KN/m. Span BC is 3.5 m long & carries a point load of 5 KN at a distance 1.5 m from support C Span CD is of 5.5 m span & carries a point load of 10 KN at midspan. Support D is hinged support. Determine support moments. Draw S.F.D. & B.M.D.. **(20)**

**Q.3** **a)** Explain Tacking rivets. Give assumptions in analysis of rivet joint. **(08)**
**b)** An angle ISA 60 × 60 × 8 mm is used as a tension member with its one leg connected by 20 mm dia. Rivets. Calculate its strength. What be its strength if it is fillet welded? $\sigma_{at} = 150$ N/mm$^2$ **(12)**

**Q.4** **a)** Give advantages & disadvantages of welded connections. **(08)**
**b)** A simply supported beam has an effective span of 10m & carries a u.d.l. of 75 KN / m . Taking $F_y = 250$ N /mm$^2$ & $E = 2 \times 10^5$ N/mm$^2$ . design the beam if it is laterally supported **(12)**

## SECTION – II

**Q.5** What are different forms of structural steel? Explain & show with diagrams five such forms mentioning their use in construction **(10)**

**Q.6** Compare between aluminum & steel with respect to strength, durability, finish and appearance, cost and workability. **(10)**

**Q.7** Write note on any **TWO.** **(10)**
**a)** Fly ash bricks.
**b)** Stabilized earth block
**c)** Concrete debri block.

**Q.8** Explain ferrocement and its types. **(10)**

**Q.9** Explain rammed earth construction of wall. **(10)**

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