

S. Y. B.ARCH. SEM – III (2010 COURSE) :WINTER - 2017

SUBJECT: THEORY OF STRUCTURES & BUILDING MATERIALS – III

Day: Monday
Date: 06/11/2017

W-2017-3249

Time: 10.00 AM TO 1.00 PM
Max Marks. 100

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.

SECTION - I

- Q.1** Solve any **FOUR** of the following (20)
- a) Explain Euler's method for axially loaded column.
 - b) Give I.S. code provisions for R.C.C. slab.
 - c) Explain 'T' beam
 - d) Explain doubly reinforced beam.
 - e) Explain two hinged arch.
- Q.2** a) A beam is 15m long & is simply supported at its ends. It carries a point load of 200 KN & 80KN at distances 4m & 8m respectively from left end. Calculate the deflection under each load by double integration method. (10)
 $E = 200 \text{ KN/mm}^2, I = 20 \times 10^8 \text{ mm}^4$.
- b) An ISMB 300 rolled steel joist is to be used as a column 5m long with both end fixed. Find the safe axial load on the column allowing a factor of safety of 3 (10)
 $F_c = 320 \text{ N/mm}^2, \alpha = \frac{1}{7500}, A = 58.70 \text{ cm}^2$
 $I_{xx} = 8985.7 \text{ cm}^4, I_{yy} = 486.3 \text{ cm}^4$
- Q.3** Design a roof slab $7.0 \times 5.5 \text{ m}$. The slab is simply supported on four side walls. Live load = 2.5 KN/m^2 . Concrete M20 & steel – Fe 415. (20)
- Q.4** A R.C.C. column 3.75 m effective length is required to resist an axial load of 2000 KN. Design column using. Concrete M20 & steel – Fe 415. (20)

SECTION – II

- Q.5** State & explain various defects in plastering. (10)
- Q.6** Define water cement ratio. State significance of water cement ratio. (10)
- Q.7** Name five types of admixtures in concrete and state their role. State in what circumstances those concretes are used. (10)
- Q.8** a) What are various forms in which steel reinforcement is available in market? Explain briefly. (05)
b) Mention & describe common defects found in steel reinforcement. (05)
- Q.9** a) What surface preparations are required to be done before painting? (05)
b) Name three types of paints and state their uses. (05)