

T. Y. B.ARCH. SEM – V (2010 COURSE) : WINTER - 2017
SUBJECT : THEORY OF STRUCTURES & BUILDING MATERIALS – V

Day : **Thursday** Time : **10.00 AM TO 01.00 PM**
Date : **09/11/2017** **W-2017-3253** Max. Marks : 100

N.B.:

- 1) Attempt **ANY THREE** questions from Section – I and attempt all questions from Section – II.
- 2) Answers to both the sections should be written in **SEPARATE** answer books.
- 3) Use of electronic non-programmable **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagrams **WHEREVER** necessary.
- 5) Figures to the right indicate **FULL** marks.
- 6) Assume suitable data if necessary.

SECTION – I

- Q.1** Write short notes on **ANY FOUR** of the following: [20]
- a) Steel gantry girder
 - b) Types of retaining wall
 - c) Advantages of pre-stressed concrete
 - d) Active and passive earth pressure
 - e) Overhead water tank
- Q.2** Design a simply supported dog-legged R.C.C staircase for institutional building with floor to floor height of 3.4 m. Riser is 170 mm and tread is 275 mm. Staircase is supported over 230 mm wide beam at the outer edge of landing. Width of landing is 1.2m. Use 16 mm diameter bars for main steel and 8 mm diameter for distribution. Use M20 grade concrete and Fe415 grade steel. [20]
- Q.3** Check the stability of a masonry retaining wall having dimensions as follows: [20]
- | | |
|----------------------------------|------------------------|
| Height of wall | - 4.5 m |
| Width of base | - 3 m |
| Thickness of wall at the top | - 600 mm |
| Unit weight of soil | - 16 kN/m ³ |
| Unit weight of masonry | - 20 kN/m ³ |
| Angle of repose | - 27° |
| Coefficient of internal friction | - 0.55 |
- Earth is retained on the vertical side of wall.
- Q.4** a) A simply supported pre-stressed beam having dimensions 230 mm × 600 mm is subjected to uniformly distributed load of 35 kN/m over its entire length. If length of beam is 7m, and beam is subjected to pre-stressing force of 600 kN at an eccentricity of 180 mm. Find extreme fiber bending stresses and plot bending stress diagram. [12]
- b) Write a short note on: [08]
- i) Methods of pre-stressing
 - ii) Sketch reinforcement of counterfort retaining wall

SECTION – II

- Q.5** Define Guniting? Explain method of application of Guniting. [10]
- Q.6** Write short notes on **ANY TWO** of the following: [10]
- a) Ready Mix Concrete (R.M.C.)
 - b) Light Weight Concrete Panels
 - c) Asphalt
 - d) D.P.C.
- Q.7** Explain advantages and disadvantages of Light Weight Concrete. [10]
- Q.8** Explain water proofing materials and methods. [10]

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