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BAR-014

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

00431

June, 2015

BAR-014 : THEORY OF STRUCTURES – II

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. 1 is **compulsory**. Answer any **four** questions from the remaining. Use of scientific calculator is permitted.*

1. Choose the most appropriate answer from the options given in questions (a) to (g) : *7×2=14*

(a) Bearing walls in buildings are normally made of

(i) Timber

(ii) Bricks

(iii) Steel

(iv) Tiles

(b) A simply supported beam of length 'L' is subjected to a UDL of intensity 'w' per unit length over its whole length. Shear force near to the support will be

(i) wL

(ii) $\frac{wL^2}{2}$

(iii) $\frac{wL}{2}$

(iv) None of these

(c) A cantilever of length 'L' is subjected to a point load 'W' at the free end. The bending moment at mid span is

(i) $\frac{WL}{2}$

(ii) WL

(iii) WL^2

(iv) $\frac{WL^2}{2}$

(d) Number of members (m), in statically determinate pin jointed plane frame having joints 'j' will be given by

(i) $m > 2j - 3$

(ii) $m = 2j - 3$

(iii) $m = 3j - 6$

(iv) $m > 3j - 6$

(e) Maximum slope in any staircase for vertical transportation may be taken as

(i) 40°

(ii) 25°

(iii) 35°

(iv) 50°

(f) Cement concrete is a/an

(i) ductile material

(ii) elastic material

(iii) brittle material

(iv) None of these

(g) Which of the following supports would absorb any action coming towards it ?

(i) Roller

(ii) Hinged

(iii) Pinned

(iv) Fixed

2. (a) Define a determinate structure. Explain how equations of static equilibrium may be used to analyse a simply supported beam subjected to a UDL. 7

(b) Explain the role of foundation in a structure. Discuss the various considerations linked to design of foundations. 7

3. (a) Define a bearing wall system. Discuss load transmission through this system. 7

(b) Discuss the precautions to be taken in the construction of domes. 7

4. (a) Enlist the names of some ductile and brittle materials of construction. Discuss how a ductile material may be better compared to a brittle material, in certain cases. 7

(b) Define lintels. Discuss how various forces are resisted by them. 7

5. (a) Discuss why displacements should be controlled in buildings. 7

(b) Discuss why reinforcement is provided in an RC beam in a framed building. 7

6. (a) Compare the load transfer mechanism between a pin jointed truss and a rigid welded truss. 7

(b) Define cuboidal forms. How are these different from prismatic forms ? 7

7. Write short notes on any ***two*** of the following : *2×7=14*

(i) Stress – strain characteristics of medium tensile steel

(ii) Stability of a structure

(iii) Principle of triangle of forces and its application in structural analysis