

Code : 011303

B.Tech 3rd Semester Exam., 2014

BUILDING SCIENCE

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
 (ii) There are **NINE** questions in this paper.
 (iii) Attempt **FIVE** questions in all.
 (iv) Question No. 1 is compulsory.

1. Choose the correct option (any seven) : $2 \times 7 = 14$

(a) Crushing strength of first-class brick should not be less than

(i) 35 kg/cm²(ii) 70 kg/cm²~~(iii) 105 kg/cm²~~(iv) 140 kg/cm²

(b) The process of mixing clay, water and other ingredients for making clay is known as

~~(i) kneading~~

(ii) moulding

(iii) pugging

(iv) drying

~~(c)~~ Number of bricks required for one cubic metre brick masonry is

(i) 400

(ii) 450

~~(iii) 500~~

(iv) 550

~~(d)~~ Initial setting time of ordinary Portland cement should be

(i) 10 minutes

~~(ii) 30 minutes~~

(iii) 60 minutes

(iv) 600 minutes

~~(e)~~ For testing compressive strength of cement, size of cube used is

(i) 5 cm

~~(ii) 7.06 cm~~

(iii) 10 cm

(iv) 15 cm

~~(f)~~ A good building stone should not absorb water more than

~~(i) 5%~~

(ii) 10%

(iii) 15%

(iv) 20%

✓(g) The differential settlement of a foundation on sandy soil should not be more than

- 20
x 19
- ✓(i) 2.5 cm
 - ✓(ii) 4.0 cm
 - ✓(iii) 6.5 cm
 - ✓(iv) 10.0 cm

✓(h) Nosing in a staircase is the outer-projection edge of the

- ✓(i) riser
- ✓(ii) tread
- ✓(iii) baluster
- ✓(iv) landing




✓(i) The moisture content in a well-seasoned timber is about

- ✓(i) 4%–6%
- ✓(ii) 10%–12%
- ✓(iii) 15%–20%
- ✓(iv) 30%

✓(j) The characteristic crushing strength of cement concrete is observed after

- ✓(i) 7 days
- ✓(ii) 14 days
- ✓(iii) 21 days
- ✓(iv) 28 days

✓2. (a) What is the bearing capacity of soil? 2
(b) Draw and discuss in brief the following types of foundation : 4×3=12

- ✓(i) Isolated footing 
- ✓(ii) Mat foundation 
- ✓(iii) Strap footing 

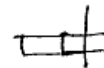
✓3. Enumerate and discuss in brief the classification of buildings as per National Building Code of India. 14

✓4. (a) Define live load and seismic load. 2+2=4

✓(b) Describe the following terms with neat sketches :

✓(i) Stretcher bond

✓(ii) Perpend



5+5=10
imaginary line
separate to
alternate
brick

✓5. (a) Explain the following : 4+4=8

✓(i) Water-cement ratio

✓(ii) Workability of concrete

✓(b) Explain how post-construction anti-termite treatment is done. 6

✓6. (a) Describe the composition of Portland cement and effects of its ingredients. 7

✓(b) Draw alternate courses of $1\frac{1}{2}$ brick thick wall in English bond. 7

7. (a) Write a short note on mansard roof truss. 7
- (b) Draw plan and section of a typical dog-legged RCC staircase. 7
8. (a) Describe fire-safety requirements of buildings. 7
- (b) Explain in brief the general principles and factors in acoustical design of a hall. 7
9. Design an RCC footing for a masonry wall 375 mm thick carrying a superimposed load of 200 kN/m. The bearing capacity of soil is 150 kN/m²; nominal cover = 50 mm. Use M 20 concrete and Fe 415 steel. [Assume any other suitable data, if necessary.] 14
