

Code : 011303

B.Tech. 3rd Semester Exam., 2013

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) The building stone can be dressed easily

- (i) just after quarrying
- (ii) after seasoning
- (iii) after some months of quarrying
- (iv) any time

(b) Red colour is imparted to bricks due to

- (i) iron oxide
- (ii) lime
- (iii) silica
- (iv) magnesia

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(c) The lime suitable for making mortar is

- (i) quick lime
- (ii) fat lime
- (iii) hydraulic lime
- (iv) pure lime

(d) Volume of 1 bag of cement weighing 50 kg is

- (i)  $3.4 \text{ m}^3$
- (ii)  $0.034 \text{ m}^3$
- (iii)  $3.05 \text{ m}^3$
- (iv)  $0.34 \text{ m}^3$

(e) Which material can be used at temperatures above  $100^\circ\text{C}$ ?

- (i) Polythene
- (ii) Teflon
- (iii) Rubber
- (iv) Paraffin Wax

(f) The strength of cement concrete depends on

- (i) water-cement ratio
- (ii) quality of water
- (iii) quality of aggregate
- (iv) quality of cement

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( Continued )

- (g) The type of foundation used on weaker soil is
- column footing
  - grillage foundation
  - raft footing
  - All of the above
- (h) When a brick is cut-off lengthwise, the cutout bricks are called
- queen closer
  - king closer
  - corbal
  - bat
- (i) In a stair the horizontal upper part of a step on which foot is placed is known as
- tread
  - foot rest
  - carpet
  - soffit
- (j) The roof having slope in all four directions is called
- hip-pitch roof
  - shed roof
  - gambrel roof
  - north-light roof

2. Design a foundation resting on sandy soil. The footing is made of M 20 grade concrete. The wall is 30 cm thick and 15 m high above the ground level. The wall supports three-storeyed residential building. The roof of the building consists of 10 cm thick RCC slab with 10 cm thick lime terracing. Assume type of flooring suitably. Draw the diagram of wall-footing. 14
3. (a) How are arches classified? Give a complete list of various types of arches. 7
- (b) Draw a neat sketch with dimension of RCC lintel along with weather shed. 7
4. (a) Describe the methods which are employed to make the flat roofs water-proof. 7
- (b) Briefly describe the construction of various tiles flooring generally used in multi-storeyed buildings. 7
5. (a) What are the important measures which are to be taken for safety against fire in case of theatres and cinemas? 7
- (b) Explain the usual provisions made in the rules for fire-resisting buildings. 7

6. (a) What is meant by workability of concrete? How is it tested in field and in laboratory? 7
- (b) What is curing? What is its significance? 7
7. (a) Describe in detail about the reinforcing steel used in reinforced cement concrete. 7
- (b) State the differences among mild steel, wrought steel, cast iron and cast steel. 7
8. Discuss the effect of the following admixtures on cement :  $3\frac{1}{2} \times 4 = 14$
- (a) Calcium chloride
  - (b) Sugar
  - (c) Gypsum
  - (d) Sodium hydroxide
9. (a) Describe briefly the tests to which bricks may be put before using them for engineering purposes. 7
- (b) Sketch and state the uses of coping brick and hollow brick. 7

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