

**BUILDING MATERIALS
(CIVL 4181)**

Time Allotted : 3 hrs

Full Marks : 70

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

**Group - A
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) A first class brick when immersed in cold water for 24 hours should not absorb water more than
(a) 15% (b) 20% (c) 22% (d) 25%.
- (ii) Which one of the following aggregates gives maximum strength in the concrete?
(a) Rounded (b) Cubical
(c) Flaky (d) Elongated.
- (iii) Le Chatelier's device is used for determining the
(a) setting time of cement
(b) soundness of cement
(c) tensile strength of cement
(d) compressive strength of cement.
- (iv) Minimum thickness of the wall where single Flemish bond can be used is
(a) Half brick (b) One brick
(c) One and a half brick (d) Two bricks.
- (v) With increase in moisture content, the bulking of sand
(a) Increases
(b) Decreases
(c) First increases to a certain maximum value and then decreases
(d) First decreases to a certain minimum value and then increases.
- (vi) When brick is cut along the length, the cut-out brick is called
(a) Bat (b) King closer
(c) Queen closer (d) Quoin header.

- (vii) In brick masonry the bond produced by laying alternate headers and stretchers in each course is known as
(a) English bond (b) Double Flemish bond
(c) Zigzag bond (d) Single Flemish bond.
- (viii) The type of pile which is driven at an inclination to resist inclined forces is known as
(a) Friction pile (b) Sheet pile
(c) Batter pile (d) Anchor pile.
- (ix) Minimum width of landing should be
(a) Equal to width of stairs
(b) Half the width of stairs
(c) Twice the width of stairs
(d) One fourth the width of stairs.
- (x) A footing constructed with two columns is called
(a) Isolated footing (b) Combined footing
(c) Strip footing (d) Strap footing.

Group - B

2. (a) Write down the classification of brick on the basis of field practice. State the characteristics of good brick.
(b) What is initial and final setting time of cement? **(3 + 5) + 4 = 12**
3. (a) Write short notes on the following:
(i) Portland Pozzolana cement
(ii) Low-heat cement.
(b) Classify aggregates according to size.
(c) What are toughness and hardness of an aggregate? **5 + 5 + 2 = 12**

Group - C

4. (a) What is the purpose of using sand in mortar?
(b) Write down the carbon content of mild steel, medium carbon steel and high carbon steel.
(c) What is stainless steel?
(d) What are the characteristics of an ideal paint? **4 + 2 + 2 + 4 = 12**

5. (a) What are the types of rolled steel sections available in India? Draw a neat sketch.
- (b) What are the precautions needed while making and using lime mortar?
- (c) Write short notes on the following:
(i) Anti-corrosive paint (ii) Bituminous paint.

4 + 4 + 4 = 12

Group - D

6. (a) What is machine foundation? Write down the general principles of designing a machine foundation.
- (b) What are king closer and queen closer?
- (c) What are the different types of doors?

6 + 4 + 2 = 12

7. (a) What is the purpose of providing a partition wall? Write short notes on the following: (i) Brick partition (ii) A.C or G.I Partition.
- (b) Why cannot a load bearing wall be demolished without taking proper precautions?
- (c) What is friction pile?

6 + 4 + 2 = 12

Group - E

8. (a) Plan a dog-legged stair for a building in which the vertical distance between the floors is 3.3 m. The stair hall measures 2.7 × 5.2 m. Draw the typical plan and cross section of the stairs.
- (b) In which cases are pitched roofs preferred?

10 + 2 = 12

9. (a) Describe trussed roof and its advantages with a neat sketch.
- (b) What are the essential requirements of a floor? Write short notes on cement concrete floor.

6 + (3 + 3) = 12