

**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) The initial setting time of OPC should be
(a) 15 mins (b) 30 mins (c) 60 mins (d) 90 mins.
- (ii) The purpose of frog on a brick is
(a) to hold the mortar firmly
(b) to make easy handling of bricks
(c) to reduce the weight of bricks
(d) none of these.
- (iii) Efflorescence of 1st class brick should not be greater than
(a) 12% (b) 15% (c) 20% (d) 25%.
- (iv) The aggregate which passes through a 4.75 mm. sieve is known as
(a) coarse aggregate (b) fine aggregate
(c) well graded aggregate (d) gap graded aggregate.
- (v) Distemper is a type of
(a) Oil paint (b) Enamel paint
(c) Water paint (d) Varnish.
- (vi) A footing provided to support a single column is known as
(a) Isolated footing (b) Combined footing
(c) Strap footing (d) Raft footing.
- (vii) A wall that bears the weight of the structure is known as
(a) Partition wall (b) Load bearing wall
(c) Internal wall (d) None of these.

- (viii) In roof trusses, all the forces are
(a) Flexure (b) Shear
(c) Axial (d) None of these.
- (ix) The upper horizontal portion of a step on which the foot is placed is called
(a) Flight (b) Riser
(c) Landing (d) Tread.
- (x) The bond in which all bricks are laid with their length in the longitudinal direction of the wall is
(a) Stretcher bond (b) Header bond
(c) English bond (d) Frog.

Group – B

2. What is efflorescence in bricks? Also mention various deleterious materials in bricks. **(2 + 10) = 12**
3. (a) Explain Hydration process of cement along with chemical reactions.
(b) Describe physical and mechanical properties of coarse aggregates.
(c) What is Alkali-Aggregate reaction? **5 + 5 + 2 = 12**

Group – C

4. (a) Write short notes on:
(i) Cement mortar (ii) Lime-surkhi mortar.
(b) What are the requirements of ideal varnish?
(c) Write a short notes on Stainless steel. **(2 × 3) + 3 + 3 = 12**
5. (a) What are the properties of Wrought iron?
(b) Write short notes on the composition of oil paint.
(c) What are the different types of mortars? Explain lime mortar. **4 + 4 + (1 + 3) = 12**

Group – D

6. (a) What is load bearing wall? Why a load bearing wall cannot be demolished without taking proper precautions?
(b) What are the essential requirements of a foundation?

(c) What is bevelled bat?

$$(2 + 3) + 5 + 2 = 12$$

7. (a) Write short notes on English bond.

(b) Define the following terms along with proper diagrams:
(i) Sill (ii) Mullion.

(c) What are the different types of shallow foundation?

$$3 + (2 \times 3) + 3 = 12$$

Group – E

8. (a) Plan a dog-legged stair for a building in which the vertical distance between the floors is 3.9 m. The stair hall measures 3 m X 5 m. Draw the typical plan and cross-section of stairs.

(b) What is damp proof course (DPC)?

$$10 + 2 = 12$$

9. (a) What are the advantages of using trussed roof?

(b) Write short notes on:
(i) Cement concrete flooring (ii) Brick flooring.

$$6 + 6 = 12$$