

**BUILDING MATERIALS**  
**(CIVL 4221)**

**Time Allotted : 2½ hrs**

**Full Marks : 60**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and any 4 (four) from Group B to E, taking one from each group.*

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

**Group – A**

1. Answer any twelve:

**12 × 1 = 12**

*Choose the correct alternative for the following*

- (i) The most important purpose of frog in a brick is to
  - (a) Emboss manufacturer's name
  - (b) Reduce the weight of brick
  - (c) Form keyed joint between brick and mortar
  - (d) Improve insulation by providing 'hollows'.
- (ii) The water absorption capacity of bricks should not be more than
  - (a) 10%
  - (b) 15%
  - (c) 20%
  - (d) 30%.
- (iii) The maximum bulking of sand is likely to occur at a moisture content of
  - (a) 5%
  - (b) 8%
  - (c) 11%
  - (d) 14%.
- (iv) Seasoning of timber is done to
  - (a) Minimize the tendency to shrink, warp and split
  - (b) Increase its strength, durability and electrical resistance
  - (c) To make it fit for preservation treatment
  - (d) None of the above.
- (v) Gypsum has
  - (a) High bulk density
  - (b) Negligible shrinkage
  - (c) Damp proofing property
  - (d) Low creep.
- (vi) What is the primary function of a foundation in a building?
  - (a) To provide ventilation
  - (b) To transfer loads to the ground
  - (c) To enhance the aesthetic look of the structure
  - (d) To support the roof.
- (vii) In brick masonry, what is the purpose of bonding?
  - (a) To improve the appearance
  - (b) To ensure the stability of the wall
  - (c) To reduce the number of bricks used
  - (d) To increase the wall thickness.

- (viii) Which bond is considered the strongest in brick masonry  
 (a) Stretcher bond (b) Header bond  
 (c) English bond (d) Flemish bond.
- (ix) What is the primary purpose of centering and shuttering?  
 (a) To support concrete during construction  
 (b) To provide ventilation  
 (c) To paint the structure  
 (d) To strengthen plastering.
- (x) Which material is commonly used for terrazzo flooring?  
 (a) Wood (b) Marble or stone chips mixed with cement  
 (c) Mud (d) Steel.

*Fill in the blanks with the correct word*

- (xi) In \_\_\_\_\_ type of bond, all the bricks are arranged in stretcher courses.
- (xii) The precast concrete piles are generally used for a maximum design load of \_\_\_\_\_ .
- (xiii) Hydraulic lime is used for \_\_\_\_\_ .
- (xiv) \_\_\_\_\_ foundation is a type of deep foundation used where soil has low bearing capacity.
- (xv) The \_\_\_\_\_ is the vertical part of a step in a staircase.

### **Group - B**

2. (a) Describe the functions of various ingredients of good brick earth. [[CO1,CO2](Understand/LOCQ)]  
 (b) Describe the effects of harmful ingredients in brick earth. [[CO1,CO2](Understand/LOCQ)]  
**6 + 6 = 12**
3. (a) What do you mean by hydration of cement? Mention the functions of Bogues compounds. [[CO3,CO4](Remember/LOCQ)]  
 (b) Write short notes on Sulphate Resisting Cement and Portland Slag Cement. [[CO3,CO4](Remember/LOCQ)]  
**(2 + 4) + (3 + 3) = 12**

### **Group - C**

4. (a) What is seasoning of timbers and why it is done? [[CO1,CO2](Understand/LOCQ)]  
 (b) Describe various defects in timber. [[CO1,CO2](Remember/LOCQ)]  
**(3 + 3) + 6 = 12**
5. (a) What is mortar? [[CO1,CO2,CO3](Understand/LOCQ)]  
 (b) What are the functions of sand, surkhi and water in mortar? [[CO1,CO2,CO3](Remember/LOCQ)]  
 (c) What are the different types of mortars used in engineering works? State the composition and function of each. [[CO1,CO2,CO3](Remember/LOCQ)]  
**2 + 4 + 6 = 12**

## Group - D

6. (a) What are the essential features of English bond? [[CO6](Remember/LOCQ)]  
(b) Draw the isometric view of a Header bond. [[CO6](Remember/LOCQ)]  
(c) What are the differences between a Header bond and English bond. [[CO6](Remember/LOCQ)]  
**5 + 5 + 2 = 12**
7. Differentiate between a load-bearing wall and a partition wall. Explain their purposes, construction techniques, and materials used. [[CO6](Understand/LOCQ)]  
**(6 + 6) = 12**

## Group - E

8. (a) Explain the key components and advantages of a dogged legged staircase. [[CO1](Remember/LOCQ)]  
(b) Plan a dog legged stair for a building in which the vertical distance between the floors is 3.6m. The stair hall measures 2.5m × 5 m. [[CO1](Analyse/IOCQ)]  
**6 + 6 = 12**
9. (a) Define pitched roofs and draw a neat sketch of a Lean-to roof. [[CO1](Remember/LOCQ)]  
(b) Explain the King post truss with a labeled diagram. [[CO1](Remember/LOCQ)]  
(c) Differentiate between a Queen post truss and a Simple steel truss. [[CO1](Remember/LOCQ)]  
(d) What are the advantages and disadvantages of AC sheets and GI sheets as roof coverings? [[CO1](Remember/LOCQ)]  
**3 + 3 + 3 + 3 = 12**

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Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	94	6	0

