

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) Gypsum consists of?
 - (a) H₂S and CO₂
 - (b) CaSO₄ and H₂O
 - (c) Lime and H₂O
 - (d) CO₂ and calcium
- (ii) In a mortar, the binding material is
 - (a) Cement
 - (b) Sand
 - (c) Surkhi
 - (d) Cinder
- (iii) The type of bond in which every course contains both header and stretchers is called
 - (a) Flemish Bond
 - (b) English Bond
 - (c) Stretcher Bond
 - (d) Raking Bond
- (iv) The workability of concrete by slump test is expressed as:
 - (a) mm³/hr
 - (b) mm
 - (c) m
 - (d) mm/hr
- (v) Separation of coarse aggregates from mortar during transportation, is known
 - (a) Bleeding
 - (b) Creep
 - (c) Segregation
 - (d) Shrinkage

- (vi) Seasoning of timber is necessary to
 - (a) Increase the fire resistance
 - (b) Increases vermin resistance
 - (c) Reduced the microbial substances
 - (d) Expel the moisture % in timber
- (vii) $\Sigma(\text{curing period} \times \text{temperature})$ is known as
 - (a) Curing
 - (b) Maturity
 - (c) Shrinkage
 - (d) None of these
- (viii) When heavy structural loads from columns are required to be transferred to soil of low bearing capacity, the most economical foundation is
 - (a) Shallow foundation
 - (b) Deep foundation
 - (c) Raft foundation
 - (d) Grillage foundation
- (ix) Quick lime is
 - (a) Calcium oxide
 - (b) Calcium hydroxide
 - (c) Calcium carbonate
 - (d) Calcium silicate
- (x) The apex line of the slopping roof is called:
 - (a) Ridge
 - (b) Eaves
 - (c) Verge
 - (d) Purlins

Fill in the blanks with the correct word

- (xi) The poor lime contains more than _____ percent of clay.
- (xii) _____ is the most important ingredient of cement that consists around 60-67%.
- (xiii) The material retained on 4.75 mm sieve is termed as _____ aggregate.
- (xiv) _____ test is commonly used to measure the workability of concrete.
- (xv) A small quantity of _____ is desirable in good brick earth.

Group - B

2. (a) Explain the slump test of concrete in detail. Explain the different types of slumps that can be formed and their significance. [[CO4](Apply/IOCQ)]
- (b) How can lime be classified? What are its types? [[CO2](Understand/LOCQ)]

8 + 4 = 12

3. Write short notes on:
- (i) Flakiness and elongation test
 - (ii) Impact value test
 - (iii) Aggregate crushing value test
 - (iv) Abrasion value test.

[[CO3](Apply/IOCQ)]

$$(4 \times 3) = 12$$

Group - C

4. (a) Write short notes on:

- (i) Paint
- (ii) Varnishes
- (iii) Distempers.

[[CO2](Understand /LOCQ)]

- (b) Write short notes on:

- (i) Defects in timber
- (ii) Characteristics of good mortar.

[[CO2](Remember/LOCQ)]

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

5. (a) What are the advantages of cement paints and what are the precautions to be taken to avoid defects of the cement paint ?

[[CO1](Apply/IOCQ)]

- (b) Differentiate between Plywood and fibreboard.

[[CO1](Remember/IOCQ)]

$$8 + 4 = 12$$

Group - D

6. (a) Enlist the essential requirements of a good foundation.

[[CO5](Remember/LOCQ)]

- (b) What do you understand by a shallow foundation. Draw sketches to show various types of shallow foundations.

[[CO6](Apply/IOCQ)]

$$4 + 8 = 12$$

7. (a) Explain the types of bricks used in masonry.

[[CO5](Analyse/HOCQ)]

- (b) As per quality the masonry bricks are classified into three classes. Explain each of that in detail.

[[CO6](Remember/LOCQ)]

- (c) Write short notes on:

- (i) Header
- (ii) Lap.

[[CO2](Apply/IOCQ)]

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

Group - E

8. (a) Describe with the help of a neat sketch the different parts of a King-post truss

[[CO6](Analyse/HOCQ)]

- (b) Describe the following terms : Newel Post , Scotia , Baluster , String .

[[CO6](Remember/LOCQ)]

$$8 + 4 = 12$$

9. (a) Write short notes on the following:
 (i) Tiled Flooring
 (ii) Marble Flooring
 (iii) Mosaic Flooring. [[C05](Remember /LOCQ)]
- (b) Write down the required characteristics of a floor to perform its functions properly. [[C05](Remember /LOCQ)]
- (3 + 3 + 3) + 3 = 12**

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	42.71	45.83	11.46

Course Outcome (CO):

After the completion of the course students will be able to

1. Gain knowledge regarding the various building and general construction products and their quality, durability and availability.
2. Gain knowledge regarding the various types of properties, uses and variety of materials used in the construction industry.
3. Study the behaviour of concrete at its fresh and hardened state.
4. Study about the concrete design mix.
5. Expose themselves to various quality control aspects of the civil engineering materials.
6. Learn and use the terms common in the building industry.

**LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.*