

**CONSTRUCTION MATERIALS AND TECHNOLOGY
(CIVL 2103)**

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) Lime mortar for structural purpose is generally made with
 - (a) Fat lime
 - (b) Hydraulic lime
 - (c) Quick lime
 - (d) White lime.
- (ii) The ultimate tensile strength of mild steel in N/mm² is
 - (a) 140
 - (b) 400
 - (c) 600
 - (d) 1000.
- (iii) How is the structure of brick tested?
 - (a) Powdered and tested
 - (b) Immersed in water and dried
 - (c) Rubbed against another brick
 - (d) Broken and examined.
- (iv) Super-plasticizers are used as admixture for the following purpose:
 - (a) To decrease the cement content
 - (b) To disperse particles, remove air bubbles and to retard settings
 - (c) To disperse particles only
 - (d) To decrease the setting time.
- (v) Which of the following increases the workability of concrete?
 - (a) Decreasing size of aggregates
 - (b) Increasing size of aggregates
 - (c) Increasing fine aggregates
 - (d) Increasing flaky aggregates.
- (vi) 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 .
- (vii) Chemical composition of quick lime is
 - (a) CaS
 - (b) CaO
 - (c) MgO
 - (d) MgS.
- (viii) The apex line of sloping roof is called
 - (a) Ridge
 - (b) Verge
 - (c) Eaves
 - (d) Purlins.

- (ix) Which of the following aggregate gives maximum strength in concrete?
 (a) Rounded aggregates (b) Elongated aggregates
 (c) Flaky aggregates (d) Cubical aggregates.
- (x) Which of the following elements of a pitched roof industrial steel building primarily resist lateral load parallel to the ridge?
 (a) Bracings (b) Purlins
 (c) Truss (d) Columns.

Fill in the blanks with the correct word

- (xi) Tricalcium aluminate helps in attaining _____ of cement.
- (xii) Brick earth should contain about _____ of silica.
- (xiii) Hydration of cement is chemical reaction of cement with _____.
- (xiv) Painting is done to prevent decay in wooden components by _____ rot.
- (xv) Admixtures which cause early setting and hardening of concrete are called _____.

Group - B

2. (a) What are the characteristics of good brick? [[C01](Remember/LOCQ)]
 (b) Write a short note on "Hydration of cement". [[C02](Understand/LOCQ)]
 (c) Briefly describe the impact test of aggregate. [[C05](Remember/LOCQ)]
5 + 4 + 3 = 12
3. (a) Write a short note on Alkali Aggregate Reaction. [[C02](Understand/LOCQ)]
 (b) Mention the properties of Wrought Iron. [[C01](Remember/LOCQ)]
 (c) Describe the Los Angeles Abrasion test of aggregate. [[C05](Remember/LOCQ)]
3 + 4 + 5 = 12

Group - C

4. (a) Explain the following: (i) Compaction factor Test, (ii) Slump Test of concrete. [[C03](Analyse/IOCQ)]
 (b) What do you mean by grade of concrete? What is meant by segregation of concrete? [[C04](Understand/LOCQ)]
(4 + 4) + (2 + 2) = 12
5. (a) What are the uses of admixtures? [[C06](Understand/LOCQ)]
 (b) What do you mean by water-cement ratio? What are the factors that affect the workability of concrete? [[C03](Remember/LOCQ)]
 (c) What do you mean by curing of concrete and why is it needed? [[C03](Understand/LOCQ)]
3 + (2 + 4) + 3 = 12

Group - D

6. (a) Explain in details with proper diagrams about the different types of pile foundations. [[CO6](Create/HOCQ)]
(b) State the rules for good bonding. [[CO6](Remember/LOCQ)]
10 + 2 = 12
7. (a) Describe the various functions served by foundations. [[CO6](Analyse/IOCQ)]
(b) Describe the different types of spread footings with neat sketches. [[CO5](Create/HOCQ)]
8 + 4 = 12

Group - E

8. (a) Plan a dog legged stair for a building in which the vertical distance between the floors is 3.9m. The stair hall measures 4m × 5m. [[CO6](Create/HOCQ)]
(b) What are the required characteristics of a floor to perform its function properly? [[CO5](Remember/LOCQ)]
8 + 4 = 12
9. (a) Describe with a neat sketch the different parts of a King Post truss. [[CO6](Create/HOCQ)]
(b) What are the objectives of plastering? [[CO1](Remember/LOCQ)]
8 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	52.08	16.67	31.25

Course Outcome (CO):

After the completion of the course students will be able to

1. Impart knowledge regarding the various building and general construction products and their quality, durability and availability.
2. Impart 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.*

