

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

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 ingredients of good brick earth that enables the brick to retain shape is

(a) Alumina	(b) Silica
(c) Iron Oxide	(d) Magnesia.
 - (ii) The rock formed by cooling down of magma or molten material is called

(a) Metamorphic Rock	(b) Sedimentary Rock
(c) Igneous Rock	(d) Stratified Rock.
 - (iii) The maximum percentage of water absorption of first class brick in 24 hours should be limited to

(a) 10%	(b) 15%	(c) 20%	(d) 24%.
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 - (iv) Quick lime is

(a) Calcium oxide	(b) Calcium hydroxide
(c) Calcium carbonate	(d) Calcium silicate.
 - (v) Which of the following aggregates gives maximum strength in concrete?

(a) Rounded aggregates	(b) Elongated aggregates
(c) Flaky aggregates	(d) Cubical aggregates.
 - (vi) Lime mortar is generally made with

(a) Quick Lime	(b) Fat Lime
(c) Hydraulic Lime	(d) White Lime.
 - (vii) The time required for seasoning of timber in air is about

(a) 30 to 60 days	(b) 60 to 120 days
(c) 120 to 180 days	(d) 180 to 240 days.

- (viii) For bridges, the appropriate foundation is

(a) pile foundation	(b) pier foundation
(c) well foundation	(d) spread footing.
- (ix) The preferred ratio of cement-sand mortar in load bearing walls is

(a) 1:2	(b) 1:6	(c) 1:8	(d) 1:12.
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- (x) C. G. I roof covering stands for

(a) Cement gauzed iron sheets
(b) Corrugated galvanised iron sheets
(c) Corrugated good iron sheets
(d) Carbon galvanised iron sheets.

Group - B

2. (a) What are the substances that may harm the qualities of good bricks?
 (b) What are the properties of first class bricks?
 (c) (i) Differentiate between Rapid Hardening Cement and Portland Pozzolona Cement.
 (ii) How is the specific gravity of cement determined?
4 + 2 + (2 + 4) = 12
3. (a) How is the lime classified based on IS specifications?
 (b) (i) What do you mean by Flakiness Index and Elongation Index of Aggregates?
 (ii) Discuss the different characteristics of aggregates.
 (c) Write a short note on any two of the following:
 (i) Alkali Aggregate reaction
 (ii) Fat lime vs Hydraulic Lime
 (iii) Soundness of cement.
3 + (2 + 3) + (2 + 2) = 12

Group - C

4. (a) Define pig iron. How is it manufactured from iron ore? Mention its properties and uses.
 (b) Mention some important uses of cast iron, wrought iron and mild steel.
 (c) How do you classify mortar? Describe with its suitable application.
(2 + 2 + 2) + 2 + (2 + 2) = 12
5. (a) (i) What do you mean by Seasoning of Timber?

- (ii) Describe any two methods of seasoning.
- (b) Describe the composition of oil paint.
- (c) Briefly describe various types of varnishes and their use. Mention the ingredients of varnishes (in details).

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

Group - D

- 6. (a) (i) Discuss various functions of foundation.
(ii) Write a short note on different types of shallow foundation with neat sketches.
- (b) Describe different types of bonds in brick work with neat sketches.

$$(3 + 3) + 6 = 12$$

- 7. (a) For a wooden panel door, point out of the following with the help of neat sketch:
(i) Head (ii) Style (iii) Top rail and Bottom rails
(iv) Panel (v) Frame (vi) Hold Fast.

- (b) What are the different sizes of doors adopted for different types of buildings?
Write short notes on:
(i) Collapsible Gate
(ii) Rolling Shutter.

$$6 + (2 + 2 + 2) = 12$$

Group - E

- 8. (a) Plan a dog legged stair for a building with a vertical floor height of 3.3 m. The stair hall measures as 2.5 m × 5 m.
- (b) What are the requirements for planning of a good staircase? How are the treads and the risers fixed?

$$6 + (3 + 3) = 12$$

- 9. (a) Describe in brief the objects of plastering and pointing.
- (b) What are the requirements of a good plaster?
- (c) Write short notes on:
(i) White Washing
(ii) Colour Washing
(iii) Distempering.

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