CONSTRUCTION MATERIALS AND TECHNOLOGY
(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) If p is the standard consistency of cement, the amount of water used in conducting the setting time test is
(a) 0.65p (b) 0.85p (c) 0.6p (d) 0.78p.

(ii) The maximum bulking of sand is likely to occur at a moisture content of
(a) 5% (b) 8% (c) 11% (d) 14%

(iii) The workability of concrete by slump test is expressed as:
(a) mm/hr (b) mm^3/hr (c) mm (d) m

(iv) Seasoning of timber is necessary to
(a) increase the fire resistance (b) increase vermin resistance
(c) reduced the microbial substances (d) expel the moisture % in timber.

(v) Air permeability method is used to determine:
(a) Specific surface of cement (b) Soundness of cement
(c) Workability of concrete (d) Flexural strength of concrete.

(vi) 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.

(vii) The type of bond in which every course contains both headers and stretchers is called
(a) Flemish bond (b) English bond
(c) Stretcher bond (d) Raking bond.

(viii) CGI roof covering stands for
(a) Cement gauzed iron sheets (b) Corrugated galvanized iron sheets
(c) Corrugated good iron sheets (d) Carbon galvanized iron sheets.

(ix) A resting place between two flights of a stair is known as
(a) Launch (b) Interval (c) Landing (d) Flier.

(x) Which cement should be preferred for mass concrete?
(a) Ordinary Portland cement (b) Sulphate resisting cement
(c) Low heat cement (d) Rapid hardening cement.

Group – B

2. (a) What are the properties of first class bricks?

(b) Explain the following terms as far as lime is concerned:
(i) Calcination and Hydraulicity
(ii) Quick lime
(iii) Slaked lime
(iv) Slaking.

(c) Write short notes on:
(i) Rapid Hardening Cement
(ii) Sulphate Resisting Cement
(iii) Portland Pozzolana Cement.

2 + 4 + 6 = 12

3. (a) Explain alkali aggregate reaction. Explain the elongation test of aggregate.

(b) Explain soundness test of cement paste.

(3 + 3) + 6 = 12

Group – C

4. (a) Mention any four factors affecting workability of cement concrete and also explain the same.

(b) Explain in details how the Compressive strength test and Flexural strength test for concrete is conducted.

4 + (4 + 4) = 12

5. (a) Mention any two stages of production of concrete. Also enumerate any two properties of hardened concrete.

(b) Among the following types of admixtures, write short notes on any two admixtures mentioned below:
(i) Air-entraining admixtures
(ii) Superplasticizers
(iii) Water-reducing admixtures
(iv) Retarding admixtures.

(c) State Abraham's law of water-cement ratio. Also, with the help of a graph, explain the relation between strength and w/c ratio.

(1 + 2) + 4 + 5 = 12

Group – D

6. (a) What is deep foundation?

   (b) Explain with sketches various types of deep foundations.

   (c) Explain in detail with neat sketches about simplex pile.

2 + 6 + 4 = 12

7. (a) Write short notes on Traditional and Modular brick.

   (b) What Is Bond? Explain with neat sketches about (i) Header Bond, (ii) Stretcher Bond, (iii) English Bond and (iv) Flemish Bond.

2 + (2 + 8) = 12

Group – E

8. (a) Explain the procedure of constructing for the following type of flooring :
   (i) Cement Concrete flooring (ii) Terrazzo Flooring

   (b) (i) State briefly the essential requirements for a good roof.
   (ii) Draw a neat sketch of a King Post truss roof and explain the same.

6 + 6 = 12

9. (a) Explain briefly the steps to be followed for planning a Dog Legged Staircase.

   (b) Plan for a stair case for a residential building with the following data: Stair Hall = 3.0 m × 5.5m.
   Floor Height = 3.6m.
   Adopt dog legged stair case.

5 + 7 = 12

Department & Section	Submission Link
CE	https://classroom.google.com/c/MjkzMDE4MzAwODc1/a/MjkzMDE4MzAwODg4/details