	Utech
Name:	
Roll No.:	To Annual VCE security and Explane
Invigilator's Signature :	

Time Allotted: 3 Hours Full Marks: 70

**CONCRETE TECHNOLOGY** 

The figures in the margin indicate full marks.

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

#### **GROUP - A**

### ( Multiple Choice Type Questions )

- 1. Choose the correct alternatives for the following:  $10 \times 1 = 10$ 
  - i) Separation of coarse aggregates from mortar during transportation is known as
    - a) bleeding
- b) creeping
- c) segregation
- d) shrinkage.
- ii) From workability point of view, the shape of aggregate suitable to use
  - a) angular
- b) irregular

c) flaky

d) none of these.

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- iii) The factors promoting the alkali-aggregate reaction are
  - a) reactive type of aggregate
  - b) high alkali content in cement
  - c) availability of moisture
  - d) all of these.
- iv) The following is a tensile test of concrete
  - a) compacting factor test
  - b) non-destructive test
  - c) cube compressive strength test
  - d) splitting test.
- v) The effect of sea water on hardened concrete is to
  - a) increase the strength b) reduce the strength
  - c) retard setting time
- d) increase its durability.
- vi) In terms of oxide compositions, the minimum % of ingredient in cement is that of
  - a) lime

- b) magnesium oxide
- c) iron oxide
- d) alumina.
- vii) Addition of pozzolana results in
  - a) reduction of heat of hydration
  - b) increased resistance to sulphate attack
  - c) reduced leaching of calcium hydroxide
  - d) all of these.

- viii) Lower water-cement ratio in concrete
  - a) increases the compressive strength
  - b) reduces the shrinkage and creep
  - c) reduces the permeability of concrete
  - d) all of these.
- ix) An accelerator shortens all of the following except
  - a) setting time
  - b) period of curing
  - c) period of removal of formwork
  - d) strength of concrete.
- x) Light-weight concrete has all the following beneficial characteristics *except* 
  - a) high strength to mass ratio
  - b) high thermal insulation
  - c) high sound insulation
  - d) reduces drying shrinkage.

#### **GROUP - B**

#### (Short Answer Type Questions)

Answer any *three* of the following

 $3 \times 5 = 15$ 

- 2. What is bulking of fine aggregate? Explain the effect of moisture content on the bulking of sand.
- 3. What do you mean by uniform graded aggregate, well graded aggregate and gap graded aggregate?
- 4. Name some empirical tests to measure workability and explain their suitability?

- 5. What are the factors affecting workability of concrete? Explain briefly.
- 6. Write short notes on any one of the following:
  - a) Fibre reinforced concrete
  - b) Polymer concrete.

#### **GROUP - C**

#### (Long Answer Type Questions)

Answer any *three* of the following.  $3 \times 15 = 45$ 

- 7. What are the different tests conducted on hardened concrete? Explain.
- 8. a) What are the factors that influence the strength of cement concrete? Briefly discuss the effects of watercement ratio and workability on the strength of concrete.
  - b) What is shrinkage? What factors promote shrinkage? What precautions will you take to reduce it? 8 + 7
- 9. a) What are design stipulations for design of concrete mix? What test data for materials are required for the design?
  - b) Describe in steps concrete mix design by the I.S. code method. 6+9
- 10. a) What are the advantages and disadvantages of PCC?
  - b) What is sulphur attack? What type of cement is used to minimize sulphur attack?
  - c) Write short note on retarder. 5 + 5 + 5

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