



SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

Higher National Diploma in Engineering (Civil)

3rd Year, 1st Semester Examination – 2016

CE 3117 – Concrete Technology

Instruction for candidates

1. This question paper consists of 02 pages including this page.
2. There are six (06) questions.
3. Answer five (5) questions and each question carries equal marks.
4. The marks for sub – questions are given by the side.

Time: Three (03) hours

Q 1 Aggregate is one of the important materials used for concrete. Due to non availability of natural aggregate substitute materials are introduced in the construction industry to produce the concrete.

- a. State two methods to select alternative fine aggregate. (02)
- b. Briefly explain the essential requirements to select good aggregate. (04)
- c. State four properties of the aggregate and briefly explain two of them (04)
- d. Explain one of the tests for aggregate which can be carried out in the laboratory. (02)
- e. Explain the importance of aggregate grading. (04)
- f. State four types of aggregate and briefly explain the usage of two of them (04)

Q 2 Concrete is widely used in the construction industry.

- a. State five different types of concrete used in the field (05)
- b. Briefly explain two of them (04)
- c. Young's Modulus, Poisson's Ratio and Absorptions are some of the concrete material properties explain briefly the above mentioned properties. (06)
- d. Workability of the concrete is one of the properties of a fresh concrete. The compacting factor test is more sensitive method of measuring workability of concrete than slump test. Briefly explain the test procedure of compacting factor test. (05)

Q 3 Durability of concrete is one of the properties of hardened concrete which is defined as its resistance to the deterioration and it influences the EXTERNAL and INTERNAL agencies.

- a. Explain the external and internal agencies (05)
- b. What are the recommendations you can make for durable concrete? (05)
- c. Explain how chloride and bad workmen ship influence to the deterioration of concrete (05)
- d. What are the steps to be taken to prevent deterioration of concrete? (05)

Q 4 At the time of the concreting, normally an adequate quantity of water is required for hydration. Therefore the concrete curing is very essential.

- a. What is curing of concrete? (02)
- b. State three (03) main purpose of curing and briefly explain them (06)
- c. State four (04) water curing methods (04)
- d. Explain briefly two of them. (04)
- e. What are the results due to poor curing? Explain briefly (04)

- Q 5.
- a. What is scaffolding? (02)
 - b. State four (04) types of scaffolding (02)
 - c. Compare and contrast the modern and conventional scaffolding (04)
 - d. What are the advantages of modern scaffolding? (04)
 - e. Explain briefly pre-tensioned and post-tensioned concrete (04)
 - f. What are the advantages and disadvantages of pre-stressed concrete? (04)

Q 6. The design of concrete mix involves the proportioning of cement, fine aggregate, coarse aggregate and water to produce a concrete which possesses the required properties.

- a. What are the two main properties to be considered in this trial mix? (02)
- b. Explain briefly the purpose of a mix design. (03)
- c. What are the information required to do the mix design (02)
- d. Initial step of mix design is to find out the target mean strength of the concrete. What is the equation used for that and explain each term of the equation. (03)
- e. State the rest of the steps to find out the mix design. (05)
- f. What are the advantages of the mix design? (05)