



Duration: **Three Hours**

Date: Thursday 04th April 2009

Time: 0930 – 1230 hours

**Answer four (4) questions, selecting at least one (1) question from section B.**

**Please write the answers to SECTIONS A and B in TWO SEPARATE BOOKS.**

**SECTION A**

*Note: Relevant field examples may be used to clarify your answers.*

1. a) A client has to impart to the project design team, a clear understanding of fundamental requirements of a project and his acceptance criteria.  
*Discuss* the fundamental requirements that should be given by a client to the design team for a major building project, and *explain* why they are important to the management of the design phase. (9 marks)
- b) QA may be considered as a systematic approach towards prevention of failure rather than detection, identifying root cause(s) and taking corrective action, based on planning rather than firefighting.  
*Discuss* the deficiencies in the tender documents prepared by consultants that cause problems with the quality, cost and timing of projects in your field of engineering and how these could be avoided. (8 marks)
- c) The ISO 9001 recommends a documented procedure for the Control of Documents.  
*Discuss* why this is essential for the design phase of a construction project. (8 marks)
2. a) *Explain* briefly what you understand by 'comparative cost planning' and *discuss* with examples how and when it could be used in the design phase to improve the quality of a project. (8 marks)
- b) *Discuss* the development of the Consolidated brief, and the information that should be given in it. (9 marks)
- c) *Explain* what you understand by 'Life cycle costing' and *discuss* its relevance for sustainable development. (8 marks)
3. a) *Discuss* the purposes served by Design Reviews and the stages of the project at which they should be held to ensure that their outcome helps to improve the quality of the project. (10 marks)
- b) *Discuss* the criteria considered in the ICTAD guidelines for grading and registration of contractors undertaking work in your field of engineering. (8 marks)
- c) *Briefly explain* three risks considered in the Risk Analysis carried out after tender evaluation but before making the final choice of contractor. (7 marks)
4. a) For a Quality and Cost based selection of Consultant for a major project for which you represent the client, *discuss* the following:
  - i) the information that you would request from the Consultants bidding for the work
  - ii) the evaluation criteria and the procedure you would follow after receiving the bid proposals. (10 marks)

- b) In the evaluation of tenders, *explain* what you understand by the term a 'substantially responsive tender' in relation to tenders for a construction contract'. (7 marks)
- c) *Explain* the necessity for Change Management during the design and construction phases of a project discussing its importance with examples from your field of engineering, (8 marks)

### SECTION B

- 5.
- a. Describe briefly how the quality of the Works could be assured in a 'Design and Build' contract, where both design and construction are both carried out by the contractor. (8 marks)
- b. 'Conformance to specifications' could be considered as an acceptable definition for achieving quality in construction contracts. However, even if the contractor conforms to all specifications applicable to a given contract, this might not necessarily lead to 'Client satisfaction'. Discuss. (8 marks)
- c. Describe how a Contractor would minimize the effects of the following factors on the quality of construction work. Illustrate your answer under each of the factors with suitable examples:
- Poor quality of material
  - Incompetent workers (both the contractor's own and the subcontractors)
  - Lack of supervision
- (9 marks)
- 6.
- a. Statistical techniques are important in quality control as well as in quality improvement.' Using suitable examples, discuss the validity of the above statement. (7 marks)
- b. For assuring quality of construction works, personnel performing them must be competent on the basis of appropriate education, training, skills and experience. What requirement or requirements in ISO 9000 would deal with this aspect of human resources available within the company and hired from outside? Illustrate your answer using examples. (8 marks)
- c. Whenever defects or non-conformities are identified during inspection and testing activities, the Contractor is supposed to correct them according to the specifications and/or to the satisfaction of the Consultant. If the Contractor is an ISO certified company, he would take corrective action related to such non-conformities as well.

Describe the purpose of Corrective Action.

Suppose a Contractor detects that some infill walls of a building being constructed by him are defective due to the following reasons:

- The brick courses have not been laid horizontally;
- The walls have not been made vertical.

What Corrective action would you propose in this situation?

(10 marks)