



Tertiary and Vocational Education Commission
Construction Technology- Part II
NCT Equivalence Examination



Instructions:

1. This paper consists of 07 questions.
2. Each question contains parts A and B. Answer only one part of each question.

1.0 Part A

- i) The following terms demonstrate vital characteristics of soil parameters. Define them and explain; (06 marks)
 - a) Void ratio
 - b) Porosity
 - c) Grading curve
- ii) What is meant by “Soil compaction” and explain the purposes of it? Discuss instances in construction, where soil compaction is essential; what are the factors that affect the quality of compaction? (07 marks)
- iii) Explain ‘Atterberg’ Limit test. (03 marks)

Part B

- i) Some dominant characteristics of soils are demonstrated by the following terms. Define them and explain; (06 marks)
 - a) Liquid limit
 - b) Plasticity Index
 - c) Well graded soil
- ii) How do you define “Earth retaining wall”? Discuss the causes affecting the stability of them? (07 marks)
- iii) Explain Proctor Compaction Test (03 marks)

2.0 Part A

- i) Well planned site organizing prior to mobilization makes site activities easier, safe and time saving. Draw a sketch of a site layout plan for a proposed 10 storied building complex. Give explanations for positioning of each service/ place/ activity. (08 marks)

- ii) Discuss the CPM (Critical Path Method) as a decision making planning tool. What are the advantages you gain from CPM in a project? (04 marks)
- iii) Give short notes on the following: (04 marks)
- a) Work breakdown structure
 - b) Resource levelling

Part B

- i) Describe the health and safety measures that should be implemented in a construction site of a twelve storied apartment block. What are the strategies you will take to make the workmen to obey and follow the safety rules and measures? (08 marks)
- ii) Explain the use of “Gantt chart” as a planning tool. Discuss advantages and disadvantages of it. (04 marks)
- iii) Write short notes on the following; (04 marks)
- a) Construction scheduling
 - b) Inventory control

3.0 Part A

- A. i) Explain in detail, determinant factors in deciding the type of foundation for a high-rise hotel complex in the coastal zone. (06 marks)
- ii) Describe the purpose of shoring in construction, giving two (02) examples for shoring types. Explain the considerate reasons in selecting the type of shoring? (04 marks)
- iii) Apart from the technical details decided and designed by the consultants with the project team, there are other compulsory technical regulations that should be obeyed for any project. These rules and regulations are set by the Govt./ semi Govt. authorities. Name four (04) such institutions and explain their respective role and limits/area of authority. (06 marks)

Part B

- i) Before placing concrete, it is the responsibility of the technical staff to verify whether the formwork is in order. What are the checks in for stability formwork that you should carry out to ensure the quality of the finished concrete? (07 marks)
- ii) Staircases are constructed to link two or more floors in a building. What are the essential factors need to be considered in deciding the type of staircase for a building? Name two (02) types of staircases used for buildings. (04 marks)

- iii) What are the visible defects on a newly painted iron railing of a fence? Give three (03) examples. What could be the reasons for the defects? (05 marks)

4.0 Part A

- i), Explain the tendering process Step by step, from calling tenders to the opening of Tenders. Your answer should include types of legal, technical and administrative documents and the purpose of them. (10 marks)
- ii) Write short notes on the following: (06 marks)
- a) Measure and Pay contracts
 - b) Variation
 - c) Preliminaries in BOQ

Part B

- i) Explain the steps in Bid Evaluation of the tendering process, after the closing of the tender till the Contract is awarded. Your answer should include types of legal, technical and administrative documents and the purpose of them. (10 marks)
- ii) Write short notes on the following: (06 marks)
- a) Detailed Estimate
 - b) Unit Rate
 - c) Design and Construction Contracts

5.0 Part A

- i) Flexible pavement and Rigid Pavement are the two main types of pavements in highways. Explain Flexible pavement with an aid of a cross section, and type of materials used for them. Under what conditions flexible type of pavement is most suitable? (06 marks)
- ii) Explain the steps that you should follow to patch a pothole. (06 marks)
- iii) Name two (02) types of Bitumen used for construction and explain their use. (04 marks)

Part B

- i) Explain the Rigid pavement with an aid of a cross section, and type of materials used for them. Under what conditions Rigid type of pavement is most suitable? (06 marks)
- ii) What are the factors that can influence the selection of road machinery for soil compaction? (05 marks)
- iii) Explain the types of culverts commonly used in highway construction. How can you select a most suitable type of culverts to a given situation (05 marks)

6.0 Part A

- i) How do you describe the roles of soakage pit and septic tank in waste water/ sewage disposal systems? Draw a neat sketch of one of them. Explain the soil parameters that affect the selection of suitable locations for a soakage pit. (10 marks)
- ii) Explain the purpose of the following; (04 marks)
 - a) Ball valve
 - b) Sluice valve.
- iii) What are the key considerable factors in selecting a suitable water pump? (02 marks)

Part B

- i) Explain the functions of vent pipe and traps in waste water/ sewage disposal systems. Draw three (03) types of traps commonly used in waste disposal systems and explain suitable places for fixing them. What is an Interceptor Manhole? (09 marks)
- ii) Explain the purpose of the following; (04 marks)
 - a) Ferule valve
 - b) Air valve
- iii) For an industrial estate, water supply system is proposed to be constructed. What are the important parameters in deciding the water demand? (03 marks)

7.0 Part A

- i) Selection for a suitable site for a Dam depends on many reasons. Explain them. Name TWO (02) types of dams in use. (04 marks)
- ii) What do you mean by “Water logging” in irrigation systems? Discuss the adverse effects that bring by water logging in cultivation. What measures do you suggest to mitigate waterlogging? (08 marks)
- iii) Ground water is also accepted as a potential source of irrigation. Differentiate deep wells and shallow wells that are widely used in irrigation. (04 marks)

Part B

- i) Name two (02) types of irrigation systems and discuss the advantages and disadvantages of them. (08 marks)
- ii) What are the key factors that control the effectiveness of any irrigation system? (04 marks)
- iii) Name four (04) causes for water loss in canals. What measures do you suggest to reduce the loss? (04 marks)