

073205T4CPJ

CARPENTRY AND JOINERY LEVEL 5

CON/OS/CAJ/CR/04/5/A

Construct And Erect Roof Structures

July /August 2024 series



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL
(TVET CDACC)**

WRITTEN ASSESSMENT

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES

The paper consists of **TWO** sections; **A & B**

You are provided with a separate answer booklet

Marks for each question are as indicated

Do Not write on the question paper

This paper consists of FOUR (4) printed pages

Candidates should check the question paper to ascertain that all pages are reprinted as indicated and that no questions are missing.

SECTION A: [40 MARKS]

Answer ALL the questions in this section.

1. Architectural drawings contain a variety of items depending on the type of drawing and purpose. Identify any FOUR common items found in an architectural drawing. (4 Marks)
2. Personal protective equipment (PPE's) help protect workers from various hazards in the workplace. Highlight any THREE types of PPE's used in a carpentry workshop. (3 Marks)
3. Mortice and tenon joint is a common woodworking joint known for its durability and versatility. Identify any THREE essential hand tools used in the construction of a mortice and tenon joint. (4 Marks)
4. Roof trusses are structural frameworks designed to support the roof of a building. Outline any FIVE advantages of a truss made of steel over a truss made of timber. (5 Marks)
5. After construction of a roof, finishing process is performed to complete the roofing system. Identify FOUR finishing steps undertaken to complete a roof. (4 Marks)
6. Roof covering is a material exposed to weather and it is required in the placement of a roof. Outline FOUR types of roof covering materials used in roof construction. (4 Marks)
7. The selection of a roof covering material is crucial and may be influenced by several factors. Highlight any FIVE factors to consider when selecting a roof covering material. (5 Marks)
8. Several types of fasteners may be used when fixing purlins to the roof framework. Identify FOUR types of fixing devices used for the above task. (4 Marks)
9. When setting out or trimming roof members, several factors should be considered to maintain structural integrity. Identify FOUR factors considered when cutting these roof members. (4 marks)
10. There are various types of Pitched roofs one of them being a single roof. State FOUR types of single roofs. (4 Marks)

SECTION B: (60 MARKS)

Answer any **THREE** questions from this section.

11. a. During construction of roof eaves, they can be structured in four ways. Using detailed sketches, show the **THREE** types of eaves used in final construction of a roof. (12 Marks)
- b. Explain **FOUR** ways of preserving eaves whose components are made from timber. (8 Marks)
12. a. One main function of a roof is to help conserve heat within the structure it covers, which can be achieved by placing the insulation material at ceiling level. However, this method can cause dampness which means danger from fungal attacks. Discuss **FOUR** ways in which this problem can be avoided. (8 Marks)
- b. There are several factors that make timber an ideal material for the ceiling. Explain **SIX** advantages of using timber as a ceiling. (12Marks)
13. a. A pitched roof is a roof that slopes in either one or more directions and is steeper than 10° to the horizontal. Using a sketch define and show the position of the following elements on a pitched roof. (10 Marks)
- i. Ridge
 - ii. Verge
 - iii. Jack rafters
 - iv. Purlin
 - v. Battens
- b. You are leading a team tasked with constructing and erecting roof trusses for a residential building according to the architectural drawings. The drawings specify the use of timber trusses and corrugated metal roofing. However, upon arrival at the construction site, you discover that the dimensions provided in the actual drawings and the actual measurements of the building are not compatible. Give **FIVE** ways on how you would approach this situation to ensure the successful completion of the roof construction project. (10 Marks)

14. a. As a carpentry and joinery craft person, you are required to demonstrate understanding when fixing roof covering materials. Explain the steps followed when laying tiles to a roof. (10 Marks)

b. You have been tasked with providing an estimate for the construction of a residential roof using asphalt shingles. The roof dimensions are 10 metres by 12 metres with a pitch of 6:12. The architectural drawings specify the use of asphalt shingles with a coverage of rate of 3 bundles per 10 square metres. Additionally, the project requires an underlayment. Calculate the total cost of materials required for the project given that the cost of shingles per bundle is 1800 Kenyan shillings and the underlayment per square metre is 50 Kenyan shillings. (10 Marks)

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