



1704/104  
CARPENTRY AND CONSTRUCTION  
MATERIALS I  
June/July 2017  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
CRAFT CERTIFICATE IN BUILDING TECHNOLOGY  
MODULE I

CARPENTRY AND CONSTRUCTION MATERIALS I

3 hours

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

- Answer booklet;*
- Scientific calculator/Mathematical tables;*
- Drawing instruments.*

*This paper consists of EIGHT questions in TWO sections; A and B.*

*Answer FIVE questions, choosing THREE questions from section A and TWO questions from section B.*

*All questions carry equal marks.*

*Maximum marks for each part of a question are indicated.*

*Candidates should answer the questions in English.*

**This paper consists of 4 printed pages.**

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

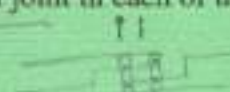
**SECTION A: CARPENTRY**

Answer **THREE** questions from this section.

1. (a) (i) State **five** safety precautions that should be observed in a workshop. *4. Avoid setting or slip objects in your way. brooms and protective gear. Read instructions. 2. Always Maximum of 10ft are allowed by tool.* (5 marks)
- (ii) Outline the **five** classes of fire. *class A - ordinary fuel. class B - flammable liquid. class C - electrical. class D - metal. class E - none.* (5 marks)

(b) Sketch and label **one** type of construction joint in each of the following classes:

- (i) lengthening joints;  
(ii) widening joints.



(4 marks)

(c) With the aid of a sketch show how a timber joist is fixed on a sleeper wall. (6 marks)

2. (a) Define the following terms as used in timber frame construction:

- (i) joinery; *the art of fitting wood together.*  
(ii) beam pocket; *hole in beam into timber by creating a groove.*  
(iii) blind mortice. *a mortice that does not go through.*

(6 marks)

(b) Outline **eight** factors which may influence the choice of a wood preservative.

- 1. Cost 2. Use of preservative 3. Durability/longevity 4. Effectiveness 5. Safety considerations* (4 marks)

(c) (i) Define the term 'hoarding'. *adjacent to Public Footpath.* (2 marks)

(ii) Sketch to show details of a vertical hoarding. (8 marks)



(a) With the aid of sketches, differentiate between the following types of roofs:

- (i) lean to roof;  
(ii) flat roof.



(10 marks)

(b) (i) List **four** types of drive way gates; (4 marks)

(ii) Sketch an open eaves details of a roof to show gutter and down pipe connection. (6 marks)

4. (a) (i) List **four** types of wood finishes applied on floors. (4 marks)

(ii) Explain **three** advantages of using the finishes in a(i) above. *Filler, Varnish, Paint, Decking* (6 marks)

- 1. Prolong life of floor.  
2. Increase value of property.  
3. Beauty/Ornamental.*





Easy to install  
Less wastage of timber

- (b) (i) State two advantages of using suspended ceiling. (4 marks)
- (ii) With the aid of a sketch show how a suspended ceiling is anchored to a structural soffit using timber. (6 marks)



5. (a) (i) List five types of portable power tools stating the uses of each. (10 marks)
- (ii) Explain two types of maintenance applied on portable power tools. (6 marks)

1. Drilling Machine  
2. Planer  
3. Sander  
4. Circular Saw  
5. Sledge Hammer  
6. Jigsaw  
7. Router  
8. Angle Grinder  
9. Grinder  
10. Nail Gun

- (b) With the aid of sketches show how a timber board is fixed on the floor using secret nailing. (4 marks)



**SECTION B: CONSTRUCTION MATERIALS I**

Answer TWO questions from this section.

6. (a) Define the following properties of construction materials:

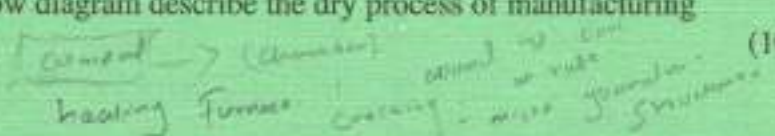
- (i) plasticity; - is the ability of a material to undergo a permanent deformation without fracture.
- (ii) thermal conductivity; - ability to transfer heat.
- (iii) density. - is the mass per unit volume.

(6 marks)

- (b) State four methods used in quarrying. (4 marks)

Use of explosives  
Drilling  
Blasting  
Removal with  
overburden

- (c) With the use of a flow diagram describe the dry process of manufacturing cement. (10 marks)



7. (a) With the aid of sketches describe the following methods of conversion of timber:

- (i) through and through method;
- (ii) tangential method.



(6 marks)

- (b) Differentiate between 'natural defects' and 'conversion' defects in timber. (6 marks)

Natural Defects: Check, Knot, etc.  
Conversion Defects: Checking, etc.

- (c) Define the following terminologies as used in commercial timber:

- (i) scantling;
- (ii) deals;
- (iii) planks;
- (iv) boards.

Timber Products & Storage  
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Physical used in wood  
timber life  
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(4 marks)

- (d) State four objectives of timber seasoning. (4 marks)



8. (a) Define the following terms in relation to metals:
- (i) annealing; *heating* *rolls*
  - (ii) non ferrous; *iron* *is not present in the metal.*
  - (iii) kerf. *composites.*
- (6 marks)
- (b) Describe **two** methods used in extraction of metals. (6 marks)
- (c) State **three** advantages and **three** disadvantages of concrete as a building material. *High compressive strength* (6 marks)
- (d) List **two** chemical admixture that can be used in concrete. (2 marks)



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