

1704/104
CARPENTRY AND CONSTRUCTION
MATERIALS I
June/July 2022
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;*
- Drawing instruments.*

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

Answer 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) State **four** safety precautions that should be observed when lifting heavy objects. (4 marks)
- (b) Explain the methods used to fight the following types of fire:
- (i) class A;
 - (ii) class K;
 - (iii) class D.
- (6 marks)
- (c) State the specific uses of the following portable power tools:
- (i) nailer;
 - (ii) angle grinder;
 - (iii) drill;
 - (iv) mitre saw.
- (4 marks)
- (d) Describe the following types of maintenance on machines:
- (i) corrective;
 - (ii) preventive;
 - (iii) routine.
- (6 marks)
2. (a) Sketch the following types of joints and state when each is used:
- (i) tee halving joint;
 - (ii) haunched mortise and tenon joint.
- (8 marks)
- (b) State **four** methods used in strengthening joints. (4 marks)
- (c) Sketch and label a plan and section of a timber grillage pad foundation and state where it is used. (8 marks)
3. (a) (i) List **two** methods used in timber frame construction.
- (ii) State **four** advantages of timber frame construction over other structures. (5 marks)

- (b) (i) State **four** preliminary activities before setting out a structure.
(ii) List **six** basic tools and materials used in setting out a building. (7 marks)
- (c) (i) State **four** methods used in timber treatment.
(ii) State **four** qualities of a good wood preservative. (8 marks)
4. (a) (i) Define timbering.
(ii) Sketch to show details of a close horizontal boarded timbering and state where it is used. (8 marks)
- (b) (i) List **four** materials used in roof covering.
(ii) State **four** functional requirements of roof covering materials. (6 marks)
- (c) State **three** conditions that should be observed in each of the following pavement laying methods:
(i) slab paving;
(ii) insitu concrete paving. (6 marks)
5. (a) Sketch the following types of rainwater goods and state where each is used:
(i) end closure;
(ii) down pipe connector. (8 marks)
- (b) State **four** disadvantages of a parquet flooring. (4 marks)
- (c) With the aid of a sketch describe a suspended ceiling and state where it is suitably used. (8 marks)

SECTION B: CONSTRUCTION MATERIALS I

Answer TWO questions from this section.

6. (a) Define the following properties of construction materials:
- (i) elasticity;
 - (ii) ductility;
 - (iii) creep.
- (6 marks)
- (b) State **four** method used in quarrying. (4 marks)
- (c) With the aid of sketches, describe the following methods used in timber conversion:
- (i) tangential;
 - (ii) through and through.
- (10 marks)
7. (a) (i) State **four** uses of clay products in construction.
- (ii) State **four** mechanical properties of soft clay. (8 marks)
- (b) (i) Explain the objectives of heat treatment in metals.
- (ii) Explain how the following types of heat treatment are carried out:
- (I) annealing;
 - (II) tempering;
 - (III) normalising.
- (8 marks)
- (c) State **four** methods used in preventing corrosion in metals. (4 marks)
8. (a) Outline **two** methods used in the manufacturer of cement. (3 marks)
- (b) Explain the role of the following admixtures in concrete:
- (i) retarders;
 - (ii) accelerators;
 - (iii) superplasticizers.
- (6 marks)
- (c) With the aid of flow diagram, describe the process of concreting. (5 marks)
- (d) Explain **two** ways of preventing segregation in concreting. (6 marks)

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