

1305/314
PLUMBING CRAFT THEORY
March/April
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL
CRAFT CERTIFICATE IN PLUMBING

PLUMBING CRAFT THEORY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Drawing instruments;

Mathematical tables/calculator.

The paper consists of **EIGHT** questions.

Answer **FIVE** questions.

ALL questions carry equal marks.

Maximum marks for each part of the question are indicated.

Candidates should answer the questions in English.

This paper consists of 4 printed pages.

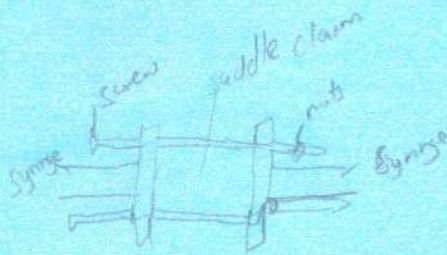
Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.



1. (a) (i) Define 'heat treatment'.
(ii) State **four** objectives achieved by heat treatment. (6 marks)
- (b) Explain the function of each of the following devices:
(i) float switch;
(ii) safety valve;
(iii) air valve. (6 marks)
- (c) Sketch and label a one pipe system of the above ground drainage. (8 marks)
2. (a) Outline **four** causes of a water pump failure. (6 marks)
- (b) Sketch and label a petrol interceptor. (8 marks)
- (c) Outline **four** faults in arc-welded joints. (6 marks)
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2. (a) Sketch a vertical section through each of the following roof joints:
(i) hollow roll;
(ii) double lock welt;
(iii) standing seam. (6 marks)
- (b) Explain the following water treatment processes:
(i) removal of hardness using base-exchange;
(ii) removal of suspended matter in water;
(iii) removal of odour in water. (6 marks)
- (c) Sketch and label an indirect hot water system in a domestic dwelling. (8 marks)



4. (a) Outline **two** safety precautions observed in a plumbing workshop in relation to each of the following:
- (i) use of electric machines;
 - (ii) floor layout;
 - (iii) personal protection equipment.
- (9 marks)
- (b) Illustrate **two** situations through which a drainage trap loses water seal due to siphonage. (8 marks)
- (c) State **three** design principles of the below ground drainage. (3 marks)
5. (a) Sketch the following tools used in plumbing:
- (i) pipe reamer;
 - (ii) pipe vice.
- (6 marks)
- (b) Sketch and label a direct cold water supply system in a domestic dwelling. (6 marks)
- (c) Sketch and label the connection of waste water pipe from a wash hand basin fixed to an external wall on the ground floor to a drain pipe. (8 marks)
6. (a) List **four** sources of water used in fire fighting. (2 marks)
- (b) With the aid of a labelled sketch, explain the function of a dead weight safety valve. (8 marks)
- (c) Sketch the following pipe supports:
- (i) build-in clip;
 - (ii) saddle clip.
- (6 marks)
- (d) State **four** uses of flux. (4 marks)



7. (a) Sketch and label a drinking water break-cistern. (6 marks)
- (b) Explain each of the following tests carried out on newly laid drains:
- (i) alignment test;
 - (ii) obstruction test;
 - (iii) smoke test. (6 marks)
- (c) With the aid of a labelled sketch explain the operation of a diaphragm ball valve. (8 marks)
8. (a) State **two** functions of a stop cock. (2 marks)
- (b) State **four** advantages of thermal insulation. (4 marks)
- (c) Sketch and label a water main connection using a saddle clamp. (6 marks)
- (d) Sketch the dry riser fire fighting system and explain its operation. (8 marks)

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