

1305/314
PLUMBING CRAFT THEORY
June/July 2021
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.

Answer any FIVE of the following EIGHT questions.

All questions carry equal marks.

Maximum marks for each part of a question are as 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) Name **three** sources of water. (3 marks)
Rain
River
- (ii) State the sources of water associated with each of the following water qualities:
(I) wholesome;
(II) suspicious;
(III) dangerous. (3 marks)
- (b) Explain the following water treatment processes:
(i) sterilisation;
(ii) coagulation. (6 marks)
- (c) Sketch and label a slow sand filter and explain its operation. (8 marks)
2. (a) Sketch and label a crydon ballvalve. (5 marks)
- (b) Sketch and label the following tools:
(i) pipe vice;
(ii) adjustable spanner. (6 marks)
- (c) (i) State **two** design factors of indirect cold water supply system for a domestic dwelling.
(ii) State **two** advantages of indirect cold water supply systems.
(iii) Sketch and label an indirect cold water supply system. (9 marks)
3. (a) Sketch and label the combined underground drainage system. (7 marks)
- (b) Sketch and label a cistern type water heater. (7 marks)
- (c) Outline the process of smelting iron ore in a blast furnace. (6 marks)

4. (a) (i) State **four** safety precautions observed during arc welding.
*putting on protective clothing eg apron
 one must wearing safety face mask to prevent intense brightness* (6 marks)
- (ii) Outline the procedure of arc welding. (6 marks)
- (b) Sketch and label the dry riser fire fighting system. (6 marks)
- (c) Illustrate the layout of a gravity solar water heating system. (8 marks)
5. (a) (i) State **two** safety precautions observed in a construction site.
- (ii) Outline **two** consequences that would follow if an accident occurs in a construction site.
it may lead to the closure of the site until it complies with the safety regulations. (b) it may also lead (4 marks)
- (b) Sketch the cross-section of each of the following roof joints:
- (i) single lock welt;
 (ii) standing seam;
 (iv) double lock welt. (6 marks)
- (c) State **two** advantages of a fully rented one-pipe drainage system. (10 marks)
6. (a) Describe the following terms as used in gas installation systems.
- (i) condensate receiver;
 (ii) control cock;
 (iii) installation pipe. (10 marks)
- (b) Sketch and label a spring-loaded pressure governor used in gas installation systems. (6 marks)
- (c) Sketch and label a longitudinal section through each of the following joints:
- (i) flange;
 (ii) pvc solvent weld. (8 marks)
7. (a) Sketch and label the following components used in a water pipeline:
- (i) air valve;
 (ii) break pressure tank. (8 marks)
- (b) (i) State **four** factors considered when selecting a pump;
 (ii) Name **four** causes of a pump failure to deliver water. (6 marks)
- (c) Sketch and label a single action reciprocating pump. (6 marks)

8. (a) Sketch and label a direct hot water system for a domestic dwelling. (6 marks)
- (b) Illustrate two causes of loss of trap seal associated with pressure difference within the drainage system. (8 marks)
- (c) Sketch and label a double trap siphonic water closet. (6 marks)



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