

Name: \_\_\_\_\_

Index No: \_\_\_\_\_ / \_\_\_\_\_

1305/314

PLUMBING CRAFT THEORY

June/July 2014

Time: 3 hours

Candidate's Signature: \_\_\_\_\_

Date: \_\_\_\_\_



THE KENYA NATIONAL EXAMINATIONS COUNCIL

## CRAFT CERTIFICATE IN PLUMBING

PLUMBING CRAFT THEORY

3 hours

## INSTRUCTIONS TO CANDIDATES

*Write your name and index number in the spaces provided above.*

*Sign and write the date of the examination in the spaces provided above.*

*You should have the following for this examination:*

*Drawing instruments*

*Answer any FIVE of the following EIGHT questions.*

*All questions carry equal marks.*

*Maximum marks for each part of a question are as shown.*

*Candidates should answer the questions in English.*

## For Examiner's Use Only

Question	1	2	3	4	5	6	7	8	TOTAL SCORE
Candidate's Score									

**This paper consists of 16 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) Two pieces of mild steel bar are to be gas welded. Illustrate an appropriate welding technique that may be used. (4½ marks)
- (b) (i) Sketch the **three** oxy-acetylene welding flames and state where each is used.  
(ii) Outline the procedure of closing down the oxy-acetylene set after use. (12½ marks)
- (c) State **one** purpose of each of the two gauges on pressure regulator for oxy-acetylene equipment. (5 marks)
2. (a) Sketch and label the **three** types of urinals and state one advantage of each. (7½ marks)
- (b) With the aid of a labelled sketch, explain the operation of a bell type w.c flushing cistern. (8½ marks)
- (c) (i) Define the following:  
- Ductility;  
- Malleability.  
(ii) State **two** uses of each of the following materials:  
- stoneware;  
- Hemp;  
- aluminium. (4 marks)
3. (a) (i) Differentiate between tapered and parallel threads;  
(ii) Name **three** classes of mild steel pipes stating their colour codes and where each may be used. (8 marks)
- (b) (i) Sketch and label a section through a cast iron screwed gland flexible joint;  
(ii) Outline the procedure of fixing cast iron pipes vertically. (8 marks)
- (c) Sketch a longitudinal section through a non-manipulative joint for copper pipes. (4 marks)
4. (a) List **six** insulating materials used in hot water systems. (3 marks)
- (b) Briefly explain how 'furring' occurs and state its effects in hot water systems. (4 marks)

- (c) Sketch and label a domestic Boiler-Cylinder hot water system that would be suitable for use with hard water showing the control valves and minimum pipe diameters. (8 marks)
5. (a) (i) State **four** advantages of flexible pipe joints over rigid joints.
- (ii) Sketch and label a section through a flexible joint suitable for each of the following pipe materials:
- I. concrete pipes;  
II. PVC pipes. (10 marks)
- (b) With the aid of a sketch, explain how the gradient of a drain is ensured using sight rails. (10 marks)
6. (a) (i) State **four** causes of over flowing in a cold water cistern and give a remedy for each.
- (ii) Outline **three** advantages of diaphragm ball valve (BRS) over a portsmouth ball valve. (7 marks)
- (b) With the aid of sketches, explain how a 'Grevak' resealing trap works. (5 marks)
- (c) Using a single line diagram, sketch and label a one pipe drainage system for a two storey building and indicate pipe diameters. (8 marks)
7. (a) Sketch and label a domestic cold water storage cistern for both hot and cold water distribution indicating the position of all connections and minimum pipe diameters. (8 marks)
- (b) (i) State **two** advantages and **two** disadvantages of direct cold water system over indirect cold water system.
- (ii) Define the following as used in water supply:
- I. Deep well;  
II. Sedimentation. (8 marks)
- (c) Outline **four** situations where it would be advisable to use cast iron drains in preference to the other pipe materials. (4 marks)
8. (a) Sketch detailed vertical sections to show:
- (i) Standing seam;  
(ii) Batten roll covered with sheet metal. (6 marks)

(b) (i) State the elements making the following alloys:

- I. brass;
- II. soft solder;

(ii) Distinguish between silver soldering and brazing.

(iii) Explain how a soldering bit is tinned.

(7 marks)

(c) (i) State **three** functions of a felt underlay in sheet metal roof covering.

(ii) State **four** safety precautions to be observed when using a ladder.

(7 marks)