

SCAN

Candidate's Name: _____ Index No: _____

1305/314
 PLUMBING CRAFT THEORY
 June/July 2015
 Time: 3 hours

Candidate's Signature: _____

Date: _____



THE KENYA NATIONAL EXAMINATIONS COUNCIL

PLUMBING CRAFT CERTIFICATE

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 examination in the spaces provided above.
 You should have drawing instruments and Mathematical tables/calculator for this examination.
 Answer any **FIVE** of the following **EIGHT** questions in the spaces provided in this question paper.
ALL questions carry equal marks.
 Maximum marks for each part of a question are as shown.
 Do **NOT** remove any pages from this booklet.
 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) Explain the safety precautions observed in the plumbing workshop with regards to:
- (i) clothing;
 - (ii) injuries;
 - (iii) behaviour. (6 marks)
- (b) List **four** classifications of fire and state the heat source for each. (6 marks)
- (c) Explain **four** design considerations for direct cylinder system of hot water supply. (8 marks)
2. (a) Explain **three** physical properties of metals. (6 marks)
- (b) Differentiate between the two classes of metals and state **two** examples in each classification. (4 marks)
- (c) (i) Sketch and label a direct cold water system in a domestic house.
- (ii) State **three** characteristics of a domestic cold water supply system. (10 marks)
3. (a) (i) Name **two** classes of mild steel pipes stating the colour codes and use of each.
- (ii) Outline **four** characteristics of a drainage system. (9 marks)
- (b) With the aid of a sketch differentiate between leftward and rightward welding techniques. (6 marks)
- (c) With the aid of a sketch explain the operation of an arch welding set. (5 marks)
4. (a) Sketch and label the connection of a:
- (i) distribution pipe to a water tank;
 - (ii) outlet from bottom of a cistern. (6 marks)
- (b) (i) Explain the phenomenon of back siphonage;
- (ii) Outline **four** strategies of preventing back siphonage. (8 marks)



- (c) Water is discharged at the rate of 700 litres per hour. Using the data provided in table 1, calculate the diameter of the discharge pipe.
- length of pipe _____ 36 m
 water head _____ 20 m
 frictional losses _____ 30%
- (6 marks)
5. (a) Calculate the amount of heat lost when 500 litres of drinking water cools from 100°C to 20°C. Take specific heat capacity of water = 4.18 kJ. (4 marks)
- (b) State **four** Kenya building requirements for sanitary appliances. (4 marks)
- (c) Sketch and label a single stack drainage system in a two-storey building for common appliances. (12 marks)
6. (a) Outline **four** reasons for using felt in copper roofing. (6 marks)
- (b) Sketch and label a metal weathering flashing. (6 marks)
- (c) Estimate the cost of installing sanitary appliances using the data given in table 1.

Table 1

SERIAL NO.	DESCRIPTION	QUANTITY	UNITS	UNIT COST
1.	Water closet	2	No.	3800
2.	Bath tub	1	No.	7900
3.	Wash hand basin	2	No.	2000

Take:

- (i) labour at 15% of cost of appliance;
 (ii) overheads at 5% cost of appliance;
 (iii) profit at 10% of cost of appliance.

(8 marks)

7. (a) Outline **four** situations that require the installation of manholes. (6 marks)
- (b) State **five** functions of an expansion pipe. (5 marks)
- (c) Outline the process of purification of drinking water. (9 marks)

