



Machakos University College

(A Constituent College of Kenyatta University)

University Examinations 2013/2014

SCHOOL OF ENGINEERING

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

Certificate in Plumbing

Plumbing Theory

Date: 25/3/2014

Time: 8:30 – 11:30 am

Instructions

1. Answer any Five of the following eight questions
2. All questions carry equal marks
3. Maximum for each part of question are indicated

SECTION A: BUILDING TECHNOLOGY

1. (a) With the aid of a well annotated diagram, show the following sources of water
 - (i) Surface source
 - (ii) Shallow well
 - (iii) Deep well(9 marks)
- (b) State five reasons for softening water. (5 marks)
- (c) With the aid of chemical symbol, illustrate the following water treated process
 - (i) Removal of temporary hardness
 - (ii) Removal of permanent hardness(6 marks)

2. (a) Enumerate three reasons for bending pipes. (3 marks)
- (b) Calculate the actual length of pipe required to make the project shown below.
What is the gain? (8 marks)
- (c) (i) State the three classes of G.I. pipes and their colour coding
(ii) What is the standard length of a G.I Pipe. (9 marks)
3. (a) Briefly explain the following terms
(i) Service pipe
(ii) Rising main
(iii) Communication pipe
(iv) Goose neck connection (8 marks)
- (b) With the aid of a well labeled diagram explain how a bit tap operates. (12 marks)
4. (a) With the aid of a well labeled sketch, explain the indirect cold water system. (16 marks)
- (b) State two advantages and two disadvantages of the indirect system of cold water. (4 marks)
5. (a) State five major safety precautions to be observed in a workshop. (10 marks)
- (b) Sketch the following tools and classify them accordingly. (10 marks)
6. (a) Name any five requirements of sanitary appliances. (5 marks)
- (b) With the aid of neat sketched, show three methods of joining sheet metal

- (c) Sketch the following rain water goods. (9 marks)
- (i) Half round gutter
 - (ii) Front apron (6 marks)
7. (a) Differentiate between ferrous and non ferrous metals, giving two examples in each case. (6 marks)
- (b) Briefly explain in the following properties of metals
- (i) Ductility
 - (ii) Tensile strength (8 marks)
- (c) (i) What is an alloy?
- (ii) State the main elements in the following alloys.
- (i) Steel
 - (ii) Soft solder (4 marks)
8. (a) State five points to be observed when using electricity for heating water. (10 marks)
- (b) Identify three types of gas water heater. (3 marks)
- (c) Illustrate with a well labeled sketch a rod type Thermostat. (7 marks)