Machakos University College

(A Constituent College of Kenyatta University)
University Examinations 2013/2014

SCHOOL OF ENGINEERING

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

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Certificate in Plumbing
Year 2

Plumbing Theory

Date: 25/3/2014 Time: 8.30 – 11.30 am

INSTRUCTIONS TO CANDIDATES

(i) Answer any five of the following eight
(ii) All questions carry equal marks
(iii) Maximum marks for each part of a question are as shown.

1. (a) Explain the safety precautions to be observed while are welding with regard to:

(i) Heat and sparks
(ii) Ultraviolet rays
(iii) Smoke (6 marks)

(b) Briefly explain the two common methods of starting the arc. (4 marks)

(c) Describe the following welding defects

(i) Undercutting
(ii) Porosity
(iii) Incomplete penetration (6 marks)

(d) With the aid of a neat labeled sketch show the layout of an ore welding circuit. (4 marks)

2. (a) With the aid sketches, explain how a "grevak" resealing trap works. (5 marks)

(b) Using a single line diagram, sketch and label a one pipe drainage system for a two storey building and indicate the pipe diameter . (8 marks)

(c) Identify any seven design requirements of a single stack system (7 marks)

3. (a) (i) Define the term "siphon"
(ii) With the aid of a sketch briefly describe how a siphon works and state its application in plumbing. (6 marks)

(b) With the aid of a neat labeled sketch explain how a bell type flushing custom operates. (6 marks)

(c) (i) Distinguish between attached and integral traps. (2 marks)

(ii) Will the aid of sketches, show the three types of traps. (6 marks)

4. (a) Define the following terms as used in drainage system

(i) Drain
(ii) Private Sewer (4 marks)

(b) Briefly describe the three systems of drainage below ground. (6 marks)

(c) Make neat sketches of the following drainage fittings;

(i) Rain water shoe
(ii) Back inlet gulley (6 marks)

(d) Sketch and label a section through a septic tank. (4 marks)

5. (a) Using a labeled single line diagram, Show a direct system of cold water supply for a two Storey house with a Kitchen Sink, Bath, cold and hot water cylinder, on ground floor and a WC and WHB and bath on the first floor. (10 marks)

(b) (i) Define the term ball valve (1½ marks)

(ii) With the aid of neat illustrative sketches, explain the operation of a delay action ball-Valve (4½ marks)

(c) Sketch and label a section through a double acting reciprocating pump. (4 marks)

6. (a) Explain the following terms as used in Hot Water installations-

(i) Stratification
(ii) Single Pipe Circulation
(iii) Furring (3 marks)

(b) With the aid of a neat labeled sketch, show the pipe arrangement for an indirect boiler cylinder hot water system for a three storied hotel, serving the following appliances. (9 marks)

(i) Shower
(ii) WHB
(iii) Bath Tub

(c) (i) Name three types of gas water heaters. (3 marks)

(ii) Sketch and label a cistern type electric water heater. 5 marks)

7. (a) State five possible causes of overflowing of a cold water cistern and give a remedy for each. (5 marks)

(b) (i) Outline the closing procedure of oxyacetylene gas welding set (3 marks)

(iii) Explain each of the following as used in water supply to high rise building

(i) Zoning
(ii) Pipe line switch
(iii) Break Cistern
(iv) Header (4 marks)

(c) (i) Distinguish between silver soldering and brazing. (4 marks)

(ii) Briefly explain how a soldering bit is tinned. (4 marks)

8. (a) State three advantages of bending pipes. 3 marks)

(b) Identify four possible causes of leakage in a bib tap and give a remedy for each. (4 marks)

(c) With the aid of a sketch, explain how the gradient of a drain is set using sight rails and bonning rods. (7 marks)

(d) Briefly explain why the following are not recommended.

(i) Very large pieces of sheet metal for roof covering
(ii) Single lock welt on a flat roof
(iii) Standing seams on roofs likely to carry pedestrians traffic (6 marks)