1904/102
PRINCIPLES OF LABORATORY AND WORKSHOP PRACTICES I
Oct./Nov. 2018
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN SCIENCE LABORATORY TECHNOLOGY

MODULE I

PRINCIPLES OF LABORATORY AND WORKSHOP PRACTICES I

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
Answer booklet;
Non-programmable scientific calculator(battery operated).
*This paper consists of **TWO** sections; **A** and **B**.*
*Answer **ALL** the questions in section **A** and any **TWO** questions from section **B**.*
*Each question in section **A** carries **4** marks while each question in section **B** carries **20** marks.*
Maximum marks for each part of a question are indicated.
Candidates should answer the questions in English.

This paper consists of 5 printed pages.

Candidates must check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (60 marks)

Answer ALL the questions in this section.

1. A victim of an accident shows the following signs and symptoms:

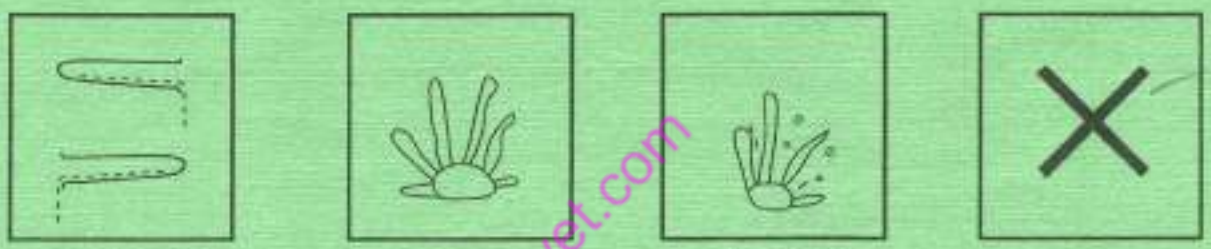
   - Weak short and shallow breath.
   - Cold, sweating nausea and confusion.

   (a) Identify the possible type of accident suffered. (1 mark)

   (b) Describe first aid treatment for the above victim. (3 marks)

2. Identify circumstances under which fire and explosion can occur in the laboratory. (4 marks)

3. Identify the hazard symbols shown in Figure 1.



(a) (b) (c) (d)

Fig. 1

(4 marks)

4. Outline the **four** steps to be followed when preparing wood for painting. (4 marks)

5. Distinguish between emetic and antidote. (4 marks)

6. Draw a labelled diagram of a mortise gauge. (4 marks)

7. Explain the use of these two tools in wood work:

   (a) firmer chisel; (2 marks)

   (b) mortise chisel. (2 marks)

8. (a) State any **four** properties of a good welding arc electrode used in metal work. (2 marks)

   (b) List any **two** hazards associated with the use of (a) above. (2 marks)

9. (a) Identify the joint in Figure 2 below used in metal work .

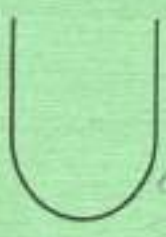


Fig. 2

(1 mark)

(b) Describe how the joint in (a) above is made. (3 marks)

10. Complete the orthographic projection drawing of a cube in Figure 3.

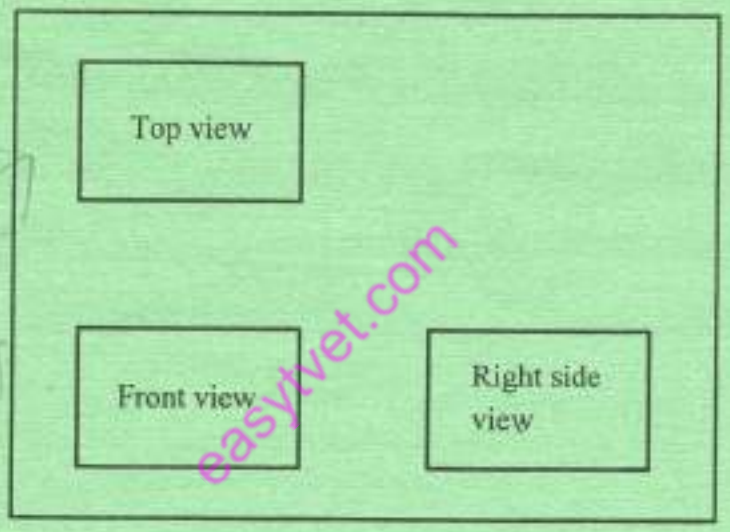


Fig. 3

(4 marks)

11. Draw the following type of lines:

(a) continuous narrow zigzag line;
(b) dashed narrow line;
(c) continuous narrow free hand line;
(d) long dashed dotted lines. (4 marks)

12. Describe any **two** microtip pencil grades and their recommended use. (4 marks)

13. Describe how the following are removed from glass wares:

(i) grease; (2 marks)
(ii) bacteriological contamination. (2 marks)

14. Describe how the laboratory pipettes are cleaned. (4 marks)

15. State the most appropriate material for making the following laboratory bench tops:

(a) balance room;
(b) dark room;
(c) glass blowing bench;
(d) microbiology laboratory. (4 marks)

SECTION B (40 marks)

*Answer any **TWO** questions from this section.*

16. (a) During a practical lesson a Bunsen burner fell on the floor upon which there is spilled acetone.

(i) Classify the type of fire that is likely to occur. (1 mark)

(ii) Describe how the fire in (a) above, can be extinguished. (7 marks)

(b) Outline procedure for making dove tail joint. (12 marks)

17. (a) Outline the operation of autoclave when sterilizing culture medium in the laboratory. (13 marks)

(b) Study the drawings in Figure 4 below and complete the table by matching numbered surfaces of orthographic drawing with the lettered surface of isometric drawing.

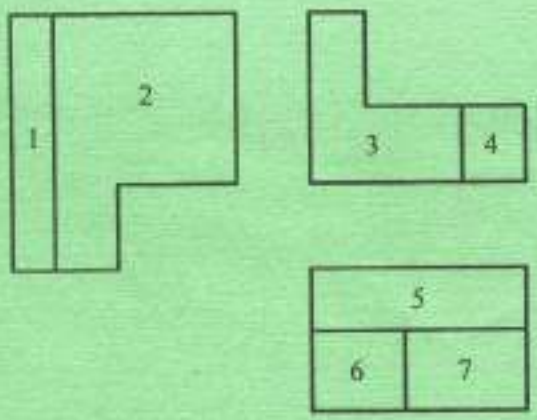


Fig. 4

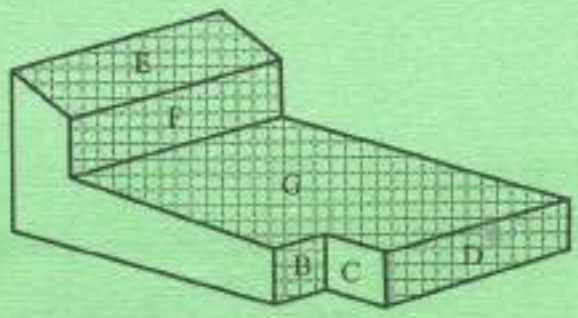


Fig. 5

A	B	C	D	E	F

(7 marks)

18. (a) Explain the storage of the following chemicals in the laboratory:

(i) methane;
(ii) hydrogen sulphide;
(iii) ammonium nitrate;
(iv) cyanide;
(v) phosphorous. (10 marks)

(b) Outline the preparation of 5% sulphuric acid in the laboratory. (8 marks)

(c) State **two** advantages of terrazzo as flooring material in the laboratory. (2 marks)

19. (a) Differentiate between a vernier calliper and a micrometer screw gauge. (4 marks)

(b) State any **four** signs and symptoms of chemical eye burn. (4 marks)

(c) Describe role of a safety officer in the laboratory. (5 marks)

(d) Draw a labelled diagram of a rip saw used in wood work. (7 marks)

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