1904/102
PRINCIPLES OF LABORATORY AND
WORKSHOP PRACTICE I
June/July 2019
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN SCIENCE LABORATORY TECHNOLOGY

MODULE I

PRINCIPLES OF LABORATORY AND WORKSHOP PRACTICE I

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
Answer booklet;
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** in the answer booklet provided.*
*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 4 printed pages.

Candidates should 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. List **four** goals in designing laboratory piping systems. (4 marks)

2. Outline the procedure for using a Bunsen burner. (4 marks)

3. (a) Identify any **four** personal protective equipment in the laboratory. (2 marks)

   (b) State the use of each of the protective equipment named in (a) above. (2 marks)

4. (a) Define "laboratory hazards". (1 mark)

   (b) List **six** classes of laboratory hazards. (3 marks)

5. Identify any **four** precautions taken in the laboratory against physical injuries. (4 marks)

6. Outline the first aid treatment administered to a wound caused by broken glass. (4 marks)

7. Describe the cleaning of dirty glassware. (4 marks)

8. Suggest the most suitable method for disposal of each of the following laboratory wastes:

   (a) concentrated sulphuric acid; (1 mark)

   (b) paraffin wax; (1 mark)

   (c) stool and urine; (1 mark)

   (d) low radioactive contaminated gloves. (1 mark)

9. Outline the care and maintenance of a microscope. (4 marks)

10. Describe the care of an analytical balance during weighing. (4 marks)

11. Explain how a victim of fainting can be assisted in the laboratory. (4 marks)

12. Describe hand sawing operation in surface preparation of wood. (4 marks)

13. Explain the importance of wood finishes. (4 marks)

14. Identify the use of each of the following metal working tools:

(a) Drill drift; (1 mark)

(b) Taper reamer; (1 mark)

(c) Morse taper sleeve; (1 mark)

(d) Chuck. (1 mark)

15. Describe the following types of metal joints:

(a) Butt joint; (2 marks)

(b) Edge joint. (2 marks)

SECTION B (40 marks)

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

16. (a) Outline:

(i) The procedure for fastening paper to drafting board in technical drawing. (6 marks)

(ii) The drawing of a vertical line on the drawing paper fastened on the drawing board. (5 marks)

(b) (i) Explain the preparation of a conceptual sketch in technical drawing. (4 marks)

(ii) Explain the importance of conceptual sketch in technical drawing. (3 marks)

(c) State the use of each of the following lines in technical drawing:

(i) visible/object line; ($\frac{1}{2}$ marks)

(ii) hidden line; ($\frac{1}{2}$ marks)

(iii) centre (axial line); ($\frac{1}{2}$ marks)

(iv) construction line. ($\frac{1}{2}$ marks)

17. (a) (i) List any **five** advantages of seasoned timber. (5 marks)

(ii) Identify any **five** types of wood defects. (5 marks)

(b) Name any **five**:

(i) ferrous metals;

(ii) non-ferrous metals. (10 marks)

18. (a) Explain **five** safety laboratory practices. (10 marks)

(b) State **ten** safety measures against electrical hazards. (10 marks)

19. (a) Outline the handling and storage of chemicals in the laboratory. (10 marks)

(b) Identify the contents of a first aid kit. (10 marks)

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