

1904/102
PRINCIPLES OF LABORATORY AND
WORKSHOP PRACTICE I
June/July 2018
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 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 carried 20 marks.

Maximum marks for each part of the question are indicated.

Candidates should answer the questions in English.

This paper consists of 3 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. (a) State the **three** goals targeted in a laboratory design. (3 marks)
(b) Name any **one** type of laboratory bench style. (1 mark)
2. Distinguish between hard wood and soft wood. (4 marks)
3. (a) Explain importance of wood seasoning. (2 marks)
(b) State any **two** advantages of kiln seasoning. (2 marks)
4. State the use of the following metal tools in metal workshop:
 - (i) hard chisel; (1 mark)
 - (ii) cold chisel; (1 mark)
 - (iii) wiring compass; (1 mark)
 - (iv) central punch. (1 mark)
5. (a) List any **two** properties of metals. (2 marks)
(b) Sketch a chisel with mushroom head. (2 marks)
6. Describe any **four** safety work practices with glassware. (4 marks)
7. Describe the maintenance of biological safety cabinet. (4 marks)
8. Explain any **four** laboratory chemical safety measures. (4 marks)
9. Describe the laboratory waste disposal general rules. (4 marks)
10. Outline the first aid treatment for chemical eye burn. (4 marks)
11. State the use of the following First Aid tools:
 - (i) adhesive tape; (2 marks)
 - (ii) tweezer. (2 marks)
12. Distinguish between emerging issues and emerging trends. (4 marks)
13. Differentiate between borderlines and construction lines. (4 marks)

14. Identify the use of the following drawing tools:
- | | | |
|-----|----------------|----------|
| (a) | Protractor | (1 mark) |
| (b) | Compass | (1 mark) |
| (c) | Drawing pencil | (1 mark) |
| (d) | Drawing pin | (1 mark) |
15. Describe brazing as a method of metal joining process. (4 marks)

SECTION B (40 marks)

Answer any TWO questions from this section.

16. (a) Explain the process of wood surface preparation. (10 marks)
- (b) Outline the procedure of drawing a 45° angle. (8 marks)
- (c) State any two types of wood defects. (2 marks)
17. (a) Describe the process of safe disposal of solid waste. (10 marks)
- (b) State any four types of laboratory hazards. (4 marks)
- (c) Describe preparation of aquaregia. (6 marks)
18. (a) Describe storage of the following:
- | | | |
|-------|---------------------|-----------|
| (i) | Peroxide; | (2 marks) |
| (ii) | Flammable solvents; | (2 marks) |
| (iii) | Acetic acid; | (2 marks) |
| (iv) | Alkali; | (2 marks) |
| (v) | Cryogenic fluid. | (2 marks) |
- (b) (i) Explain the care and handling of a centrifuge. (5 marks)
- (ii) Outline how a reading of 25.44 is arrived at in a vernier caliper. (5 marks)
19. (a) Outline the procedure for silver soldering. (10 marks)
- (b) Outline the cleaning process of a buret. (4 marks)
- (c) Describe the safety practices when using the following:
- | | | |
|-------|-------------------|-----------|
| (i) | Lathe machine; | (2 marks) |
| (ii) | Drilling machine; | (2 marks) |
| (iii) | Grinding machine. | (2 marks) |

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