

2914/103
2915/103
LABORATORY AND
WORKSHOP PRACTICE
June/July 2019
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN APPLIED BIOLOGY
DIPLOMA IN ANALYTICAL CHEMISTRY

MODULE I

LABORATORY AND WORKSHOP PRACTICE

3 hours

INSTRUCTIONS TO CANDIDATES

You should have an answer booklet and scientific calculator for this examination.

*This paper consists of **TWO** sections: **A** and **B**.*

*Answer **ALL** the questions in section **A** and any **THREE** 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 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 (40 marks)

Answer ALL the questions in this section.

1. State four safety features in the design of a laboratory. *Safety shower, ventilation, fire extinguishers, floor* (4 marks)
2. Explain the application of the following floor surfaces in the laboratory.
- (i) Linoleum (1 mark)
 - (ii) Terrazzo (1 mark)
 - (iii) Asphalt (1 mark)
 - (iv) Wood - *used in labs where there's no moisture.* (1 mark)
3. Explain why it is dangerous and unsafe to pour inflammable solvents down the sink. *They may corrode the pipe.* (4 marks)
4. State four causes of error in weighing while using an open balance. *vibration, when the balance is not set at zero, placing the product directly* (4 marks)
5. Outline how crucibles are cleaned in the laboratory. (4 marks)
6. Distinguish between first degree burn and third degree burn. (4 marks)
7. Draw the symbols that represent following hazards:
- (a) Irritant; (1 mark)
 - (b) Flammable; (1 mark)
 - (c) Dangerous for environment; (1 mark)
 - (d) Oxidising. (1 mark)
8. Describe how hazardous chemical waste is disposed. *then solution is first diluted then flushed into the drainage - strong acids neutralisation - radioactive material placed in the sun to decay then sealed in lead* (4 marks)
9. Describe:
- (a) the dove tail saw and carcass saw; (2 marks)
 - (b) state application of each of the saws above. (2 marks)
10. Draw the diagrams of the following metal work tools:
- (a) Slip joint pliers; (2 marks)
 - (b) Long nose pliers. (2 marks)

SECTION B (60 marks)



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

11. (a) Describe how the blade of a plane is sharpened. (7 marks)
- (b) Outline how a dovetail joint is made. (9 marks)
- (c) Give **four** precautions that should be taken when handling nitric acid in the laboratory. (4 marks)
12. (a) Describe the steps involved in weighing process in the laboratory using a digital balance. (7 marks)
- (b) State **four** ideal conditions that should be met in a balance room. (4 marks)
- (c) Explain the classification of flammable chemicals in the laboratory. (9 marks)
13. (a) Describe the steps involved in making a blazing joint. (6 marks)
- (b) List any **five** properties of aluminium alloys. (5 marks)
- (c) Describing first aid treatment for the following burns: (3 marks)
- (i) Hydrochloric acid; NaHCO_3
 - (ii) Phosphorous; 70% alcohol
 - (iii) Alkali. NH_4Cl & CH_3COOH
14. (a) Outline how surgical gauze can be sterilized using bench autoclave. (10 marks)
- (b) List any **five** factors that determine size of gangway in the laboratory. (5 marks)
- (c) List **five** factors that should be considered when selecting materials for bench tops. (5 marks)
15. (a) Outline the steps for creating an isomeric drawing. (4 marks)
- (b) Distinguish between first angle and third angle projections. (8 marks)

WATER
Tissue

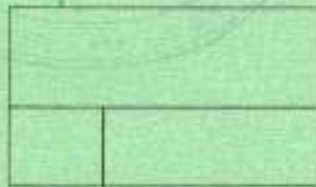
Instructions that to
people using the lab
Purpose of the work being done
Type of equipment in the lab
Handle with care

Important to autoclave to ensure
Allow the load to stand for 5 mins
Open the autoclave to release vapour

easywet.com
good conditions up load
non-toxic & durable
Good mechanical strength
mp 95.9
any flammable gases
any flammable liquids
any flammable solids
physical method of sterilisation

- (c) The figures 1, 2 and 3 shows the side views, front view and top view of a machine block.

Figure 1



Side view

Figure 2



Front view

Figure 3



Top view

Draw isometric view of the machine block.

(8 marks)

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