

1903/102  
APPLIED SCIENCE AND  
LABORATORY PRACTICE  
June/July 2020  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**CRAFT CERTIFICATE IN FOOD PROCESSING AND PRESERVATION  
TECHNOLOGY**

**MODULE I**

APPLIED SCIENCE AND LABORATORY PRACTICE

3 hours

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*answer booklet;*

*non-programmable scientific calculator.*

*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 as shown.*

*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 questions in this section.*

1. Differentiate between osmosis and active transport. (4 marks)
2. Explain the effect of water on the rate of growth of micro-organisms. (4 marks)
3. The Figure 1 shows a side view of the human male reproductive system.
  - (a) Name the parts labelled A and B. (2 marks)
  - (b) Explain the functions of the part labelled C. (2 marks)

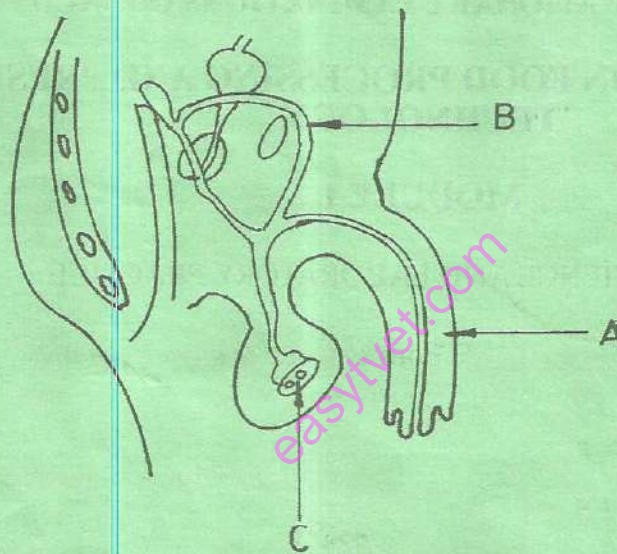


Figure 1

4. List four methods of laboratory waste disposal. (4 marks)
5. Explain each of the following as used in glass blowing technology:
  - (a) fire polishing; (2 marks)
  - (b) glass bending. (2 marks)
6. State four precautions taken when storing cryogenes. (4 marks)
7. Name four utilities that should be incorporated when renovating a building into a laboratory. (4 marks)
8. State four symptoms shown by a person affected by electric shock. (4 marks)



9. An element X, consists of three isotopes with mass number 22, 24 and 25 with percentage abundance of 89.6%, 6.4% and 4.0% respectively. Calculate the relative atomic mass of element X. (4 marks)
10. Distinguish between each of the following:
- (a) atomic mass and mass number; (2 marks)
  - (b) element and compound. (2 marks)
11. The dimensions of a cuboid are 6.35 cm by 4.75 cm by 0.74 cm. Calculate its volume giving the answer in standard form. (4 marks)
12. Describe each of the following types of fluid flow:
- (a) Laminar flow; (2 marks)
  - (b) Turbulent flow. (2 marks)
13. With the aid of a diagram, explain the quarter sawing method of timber conversion. (4 marks)
14. Explain the functions of each of the following parts of vernier calipers:
- (a) Vernier scale; (2 marks)
  - (b) Main scale. (2 marks)
15. Name **four** tools used in technical drawing. (4 marks)

**SECTION B (40 marks)**

*Answer any TWO questions from this section.*

16. (a) Define each of the following ecological terms:
- (i) Population; (2 marks)
  - (ii) Community. (2 marks)
- (b) State **six** important functions of water in living organisms. (6 marks)
- (c) Explain **five** effects of man's activities on the environment. (10 marks)



17. (a) Name **five** personal protective equipment for a laboratory technician. (5 marks)
- (b) State **fifteen** safe storage methods of chemicals in the laboratory. (15 marks)
18. (a) State **six** uses of halogens and their compounds. (6 marks)
- (b) Write the chemical equations for the reactions between:
- (i) Magnesium and dilute sulphuric acid; (2 marks)
- (ii) Aluminium and dilute hydrochloric acid. (2 marks)
- (c) Water with negligible viscosity flows steadily through a horizontal pipe of varying cross-section area. At point **A** of cross section area  $10 \text{ cm}^2$ , the velocity is  $0.2 \text{ m/s}$ . Calculate the:
- (i) velocity at point **B** of cross section area  $2.5 \text{ cm}^2$ . (4 marks)
- (ii) pressure difference between points **A** and **B**, given that the density of water is  $1000 \text{ kg/m}^3$ . (6 marks)
19. (a) Difference between front elevation and end elevation as used in technical drawing. (4 marks)
- (b) State **four** characteristics of hardwood trees. (4 marks)
- (c) Explain the safe storage of timber in a closed building. (12 marks)

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