

1904/202  
PRINCIPLES OF LABORATORY AND  
WORKSHOP PRACTICE II  
Oct./Nov. 2021  
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL  
CRAFT CERTIFICATE IN SCIENCE LABORATORY TECHNOLOGY  
MODULE II

PRINCIPLES OF LABORATORY AND WORKSHOP PRACTICE II

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 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 5 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. Distinguish between macrophotography and microphotography. (4 marks)
2. Figure 1 shows two tools, A and B, used in glass blowing laboratory.

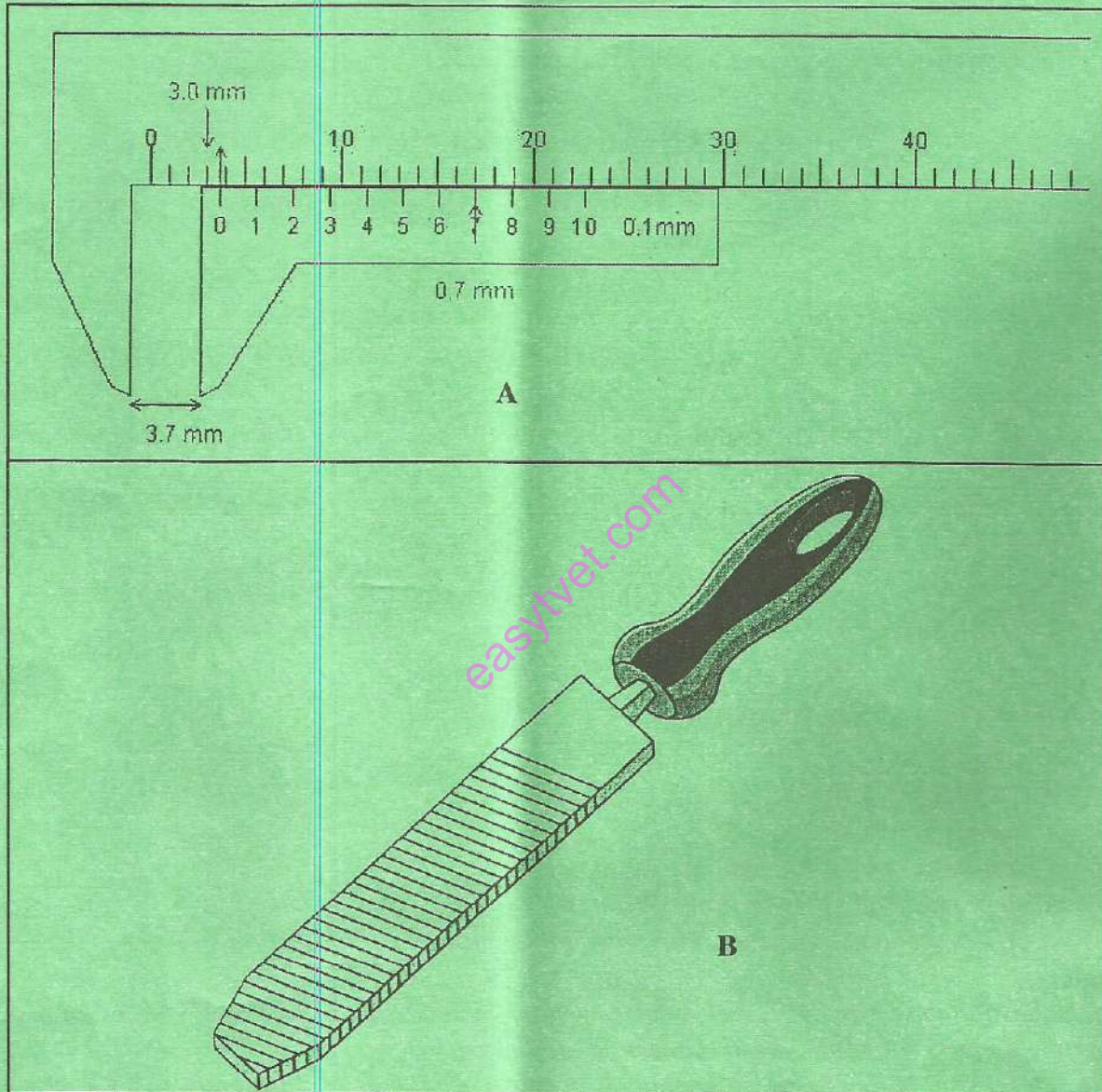


Fig. 1

- (a) Name the tools labelled A and B. (2 marks)
- (b) State the use of each tool. (2 marks)



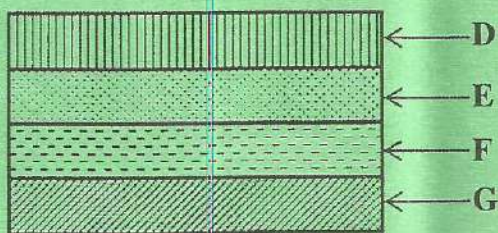
3. Explain the use of each of the following purchasing documents in the laboratory store:
- (a) pro forma invoice; (2 marks)
  - (b) bill of sale. (2 marks)
4. State any **four** methods of stock taking. (4 marks)
5. Highlight **four** reasons of laboratory animals euthanasia. (4 marks)
6. Describe how to restrain a guinea pig in the laboratory. (4 marks)
7. Distinguish between projection printing and contact printing. (4 marks)
8. Outline the procedure of making a bulb from a glass tube. (4 marks)
9. Describe the bloom as formed on a glass during blowing. (4 marks)
10. (a) State the significance of a green house in growing laboratory plants. (2 marks)
- (b) Name any **two** rabbit diseases. (2 marks)
11. State the use of each of the following in a green house:
- (a) limestone; (1 mark)
  - (b) vermiculite; (1 mark)
  - (c) peat moss; (1 mark)
  - (d) perlite. (1 mark)
12. State any **two** classifications of vacuum and their respective pressure range. (4 marks)
13. (a) Define the term 'cryogenics'. (1 mark)
- (b) Differentiate between cryogens and ordinary liquids. (3 marks)
14. The ideal gas equation is expressed as  $PV = nRT$ . Explain how some parameters in the equation can be altered to create a vacuum. (4 marks)
15. Differentiate between each of the following:
- (a) monomer and polymer; (2 marks)
  - (b) thermoplastics and thermosetting plastics. (2 marks)



**SECTION B (40 marks)**

*Answer any TWO questions from this section.*

16. (a) (i) Draw a labelled sketch of a water jet pump. (4 marks)  
(ii) Explain the operation of water jet pump in creating a vacuum. (6 marks)
- (b) Explain the importance of applying low temperature during surgery. (5 marks)
- (c) Describe the top-fill technique as used in filling of cryogenics in a cryogenic vessel. (5 marks)
17. (a) State **five** properties of plastics. (5 marks)
- (b) (i) Define the term 'additives' as used in manufacture of plastics. (1 mark)  
(ii) List **two** examples of additives used in manufacture of plastics. (2 marks)
- (c) List **two** uses of polyamide (nylon). (2 marks)
- (d) (i) State **four** objectives of science laboratory store management. (4 marks)  
(ii) Outline the process of good receipt in the laboratory from suppliers. (6 marks)
18. (a) Describe the process of making a glass U-tube in glass blowing. (10 marks)
- (b) Figure 2 shows a section of a black and white photographic film.



**Fig. 2**

- (i) Identify the parts labelled D, E, F and G. (4 marks)
- (ii) State the function of each of the parts identified in (i). (4 marks)
- (c) Define the term 'film speed'. (2 marks)



19. (a) Outline the procedure of collection of blood from rabbit's ear artery. (10 marks)
- (b) State the information that should be present on a catalogue. (6 marks)
- (c) Outline the precautions necessary while handling developer solution in a dark room. (4 marks)

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