

051106T4APB

APPLIED BIOLOGY LEVEL 6

APB/OS/AB/CC/02/6/A

Apply Standard Laboratory Practices

March/April 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL
(TVET CDACC)**

WRIT SSMENT

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INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Attempt **ALL** questions in section A and **ANY THREE** (3) questions in section B.
3. Marks for each question are indicated in the brackets.
4. Candidates are provided with a separate answer booklet
5. Do not write on the question paper.

This paper consists of FOUR (4) printed pages

**Candidates should check the question paper to ascertain that all pages
are printed as indicated and that no questions are missing.**

SECTION A (40 MARKS)

Attempt ALL the questions in this section.

1. Safety in a science laboratory is very important, therefore all samples must be labelled to avoid accidents. State FOUR pieces of information that should be put on the label of freshly prepared laboratory reagents. (4 Marks)
2. Glass is a product formed by fusion of various oxides involving shaping molten glass tubing to serve as glass apparatus. Identify the steps involved in preparing an L-BEND from a glass tubing of 20 cm long, while observing science laboratory procedures. (4 Marks)
3. Cleaning is the act of removing dirt or something undesirable. Briefly explain how a dirty microscope slide is cleaned. (4 Marks)
4. Symbols are universally recognized and are designed to alert individual in the presence of hazardous or dangerous material. Draw the symbols that represent the following types of hazards.
 - a) Biohazard. (1 Mark)
 - b) Corrosive. (1 Mark)
 - c) Flammables. (1 Mark)
 - d) Oxidizing. (1 Mark)
5. Laboratory animals should be properly used and treated humanely. State FOUR uses of laboratory animals. (4 Marks)
6. Storing documents refers to the processes and systems used to keep documents safe and accessible. Name uses of the following stored documents.
 - a) Letter of inquiry. (1 Mark)
 - b) Credit note. (1 Mark)
 - c) Package note. (1 Mark)
 - d) Debit note. (1 Mark)
7. Many of the reagents used in science are in form of solutions which need to be purchased or prepared. Calculate the mass of lead II Nitrate $\text{Pb}(\text{NO}_3)_2$ that will be required to prepare 1000 ppm of Lead II ions Pb^{2+} in 500cm³ volumetric flask. (4 Marks)
8. There are several injuries that might occur in a busy laboratory and can cause harm to an individual. State the meaning of the following injuries.

- a) Arterial bleeding. (1 Mark)
 - b) Dislocation. (1 Mark)
 - c) Burn. (1 Mark)
 - d) Scald. (1 Mark)
9. While analysing biological samples in a laboratory, trainees are likely to be exposed to biological hazards. Identify FOUR of these hazards that are likely to be encountered. (4 Marks)
10. You have been tasked with managing laboratory animals at your work place. Sadly, an outbreak of salmonellosis occurs causing massive deaths.
- a) Identify TWO methods you will use to dispose the carcasses. (2 Marks)
 - b) List TWO physical methods you will employ to carry out euthanasia. (2 Marks)

SECTION B (60 MARKS)***Attempt ANY THREE (3) questions in this section.***

11.

- a) A good laboratory should comply with all stipulated health and safety requirements as per the laboratory manual. Name FIVE Personal Protective Equipment (PPEs) and explain their importance. (10 Marks)
- b) Planning is a critical function of management that helps organizations to reach their targets. Describe FIVE functions of planning. (10 Marks)

12. Laboratory safety is concerned with safe practices in the laboratory. Failure to observe these will result in risks and hazards which may lead to injury to the laboratory user or damage to property.

- a) Explain FIVE methods of preventing mechanical hazards. (10 Marks)
- b) Explain FIVE situations where electricity can initiate laboratory fire. (10 Marks)

13. Laboratory design, layout and services is one of the most essential steps in the establishment of any scientific laboratory. Having a clear vision for the laboratory facility is a key element that will contribute to the success of laboratory design and layout.

- a) Identify FIVE laboratory services and explain at least ONE function in each case. (10 Marks)
- b) Effective control systems are essential for ensuring that an organization is running effectively and efficiently. Explain FIVE factors which facilitate effective control systems. (10marks)

14. Fire is the rapid oxidation of a material in an exothermic chemical reaction of combustible material with an oxidant.

- a) Classify fire risks and explain how each class can be extinguished. (12 Marks)
- b) Glass is a product formed by fusion of various oxides involving shaping molten glass tubing to serve as glass apparatus. Explain the functions of the following tools and equipment as used in a glass-blowing laboratory. (8 Marks)
 - i. Diamond glass cutter.
 - ii. Iron wire.
 - iii. Rimming, bordering and flaring tools.
 - iv. Carbon plate.