

2404/306

2407/306

2411/306

LABORATORY PRACTICE
AND MANAGEMENT

Oct/ Nov, 2017

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN APPLIED BIOLOGY
DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY
DIPLOMA IN ANALYTICAL CHEMISTRY

LABORATORY PRACTICE AND MANAGEMENT

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 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. Explain how the following equipment may be maintained in the laboratory:
 - (a) laboratory water stills;
 - (b) pH-meter;
 - (c) microscopes;
 - (d) balances.

Oven (4 marks)

2. (a) Give **two** categories of dirty glassware. (1 mark)
- (b) Outline the proper procedure of cleaning laboratory glassware to be safe for use both chemically and biologically. (3 marks)

3. (a) List any **four** basic requirements of a preparation room in the laboratory. (2 marks)
- (b) Describe the preparation of the following solutions in the laboratory:
 - (i) 46% sodium chloride solution from 97% aqueous sodium chloride solution. (1 mark)
 - (ii) 1000 ppm solution of Pb starting with lead (Pb) pure metal (R.A.M, Pb = 207.2 g). (1 mark)

4. List any **four** methods used in leak hunting in the vacuum systems. (4 marks)

5. (a) Define the term management. (1 mark)
- (b) State any **three** functions of a manager. (3 marks)

6. (a) Define the term "span of control" as used in management. (2 marks)
- (b) List any **two** factors which influence the span of control. (2 marks)

7. Name any **four** routes of inoculation that may be used on laboratory animals. (4 marks)

8. Define the following terminologies as used in photography:
 - (a) film speed;
 - (b) telephoto lens;
 - (c) depth of field;
 - (d) fixing.

(4 marks)

9. List any four research fields where cryogenic technology may be applied. (4 marks)
10. Describe what can be done in case of the following:
- (a) staff sustains a snake bite: *if no snake it should be a snake to hospital tie the snake injured for administration danger* (2 marks)
- (b) - staff is exposed to about 60 - 70% dose of nuclear radiation. *address* (2 marks)

SECTION B (60 marks)

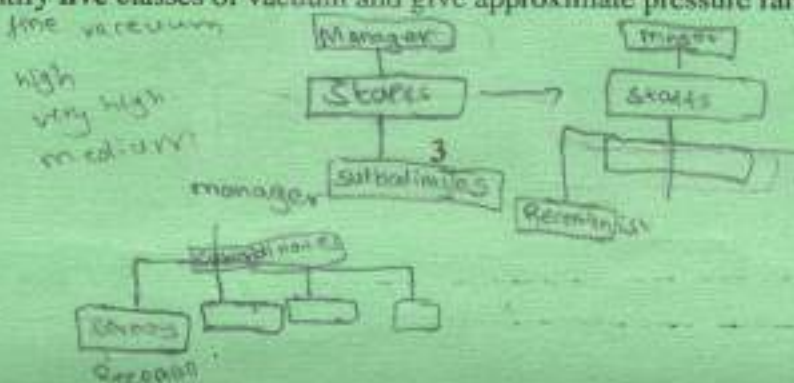
Answer any **THREE** questions from this section.

11. * You have been appointed to the position of a chief laboratory technologist of a large laboratory complex where your main responsibilities include the management and planning of the various types of laboratories.

- (a) Explain how to prepare a discussion paper for the management team on the following:
- (i) how to plan for an inflammable and explosive chemical store. (5 marks)
- (ii) details of the safety requirements for the above chemical store. (5 marks)
- (iii) draft of a general code of practice which the other laboratory staff should follow in order to ensure maximum safety within the store and the laboratories in respect to flammables. (3 marks)
- (b) Describe systematically the procedure for chemical water treatment. (7 marks)

12. y (a) (i) Define an organisation chart. *Adv → easy to explain → all of the closing point during organisational review process* (1 mark)
- (ii) State its importance. (3 marks)
- (b) Construct a typical organisation chart for a medium to a large production company. (10 marks)
- 2 (c) State any three advantages and disadvantages of organisation charts. (6 marks)

13. * (a) Draw a labelled block diagram of a diffusion pump vacuum system. (10 marks)
- (b) Identify five classes of vacuum and give approximate pressure ranges for each. (10 marks)



2404/306
2407/306
2411/306

Oct./Nov. 2017

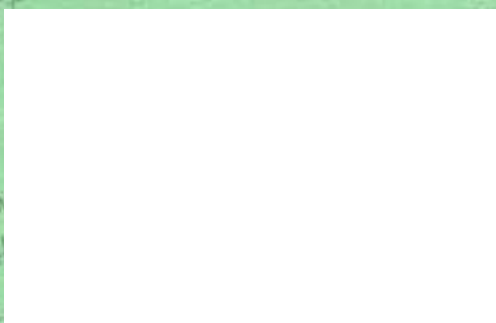
Turn over

14. (a) Describe how laboratory animal diseases are spread and controlled in laboratory animal houses. (10 marks)
- (b) Identify five differences between a single lens reflex (SLR) camera and a twin lens reflex (TLR). (10 marks)

15. (a) Explain with practical details how to carryout the following:
- (i) process exposed monochrome (black and white) film to produce a negative. (8 marks)
 - (ii) produce an enlargement print from a normal good quality 35 mm black and white negative. (8 marks)
- (b) (i) Define the term "indicator" as used in the laboratory. (1 mark)
- (ii) State two characteristics of a good indicator. (2 marks)
- (iii) Define acids and bases according to the Bronsted-Lowry theory. (1 mark)

14: New animals
 → during breeding
 → introduction of new animals from unknown sources
 * → Congestion in animal houses
 → accumulation of & bacterial
 → drinking of water or contaminated food materials

Na₂SO₄
 Na₂CO₃



or indicator
 are pair acceptor
 objects
 speed can not be changed
 ment of f No

THIS IS THE LAST PRINTED PAGE.

10 min - in H₂O
 developer soln
 stop solution
 fixer solution
 since by cleaning hand from developer
 the solution of developer
 these developer
 developer clear
 underdevelop black