

2404/304

BIOCHEMISTRY, ANATOMY AND PHYSIOLOGY

Oct./Nov. 2011

Time: 3 hours

27 MAR 2012



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN APPLIED BIOLOGY

BIOCHEMISTRY, ANATOMY AND PHYSIOLOGY

3 hours

#### INSTRUCTIONS TO CANDIDATES

*You should have the following for this examination:*

- Answer booklet;*
- scientific calculator.*

*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 the question are indicated.*

**This paper consists of 3 printed pages.**

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

2b

SECTION A: (40 marks)

Answer ALL questions in this section.

1. State any four functions of carbohydrates. <sup>3</sup> (4 marks)  
*- Release energy in respiration*  
*- 5*
2. (a) Distinguish between saponification and iodine numbers. (2 marks)  
(b) List any two important terpenoid compounds. (2 marks)
3. (a) Draw the structure of a triglyceride. (2 marks)  
(b) Distinguish between catabolic and anabolic processes. (2 marks)  
*Catabolic - refers to all pathways breakdown of molecule to simpler components*  
*Anabolic - the utilization of food source to increase mass*
4. Differentiate DNA from RNA. (4 marks)
5. State four applications of growth hormones in plants. — (4 marks)
6. Draw a labelled diagram of completed gastrula. (4 marks)
7. (a) Distinguish between the specific gravity of urine of diabetes mellitus patient and that of a diabetes insipidus. (2 marks)  
(b) List two groups of urinary deposits. (2 marks)
8. (a) Distinguish between the function of meristematic and pericycle tissues. (2 marks)  
(b) Name two theories that explain translocation in plants. (2 marks)  
*- 10/12*
9. Distinguish between: (2 marks)  
(a) hypogeal and epigeal types of germination. (2 marks)  
(b) tendon and ligaments. (2 marks)  
*tendon*  
*ligament*
10. A given gamma-globulin has an isoelectric point of 6.9. Determine the electrode towards which it will migrate when the pH is 8.5. (4 marks)

SECTION B: (60 marks)

Answer any THREE questions from this section.

11. (a) Table I shows results of an experiment to determine the effects of temperature on the rate of enzyme activity.

Table I.

Temperature (°C)	Rate of Product formation (mg/hr)
0	0
20	40
40	50
60	40
80	20
100	0

- (i) Plot the results on a graph. (5 marks)
- (ii) Explain the curve. (5 marks)
- (b) Describe the transport of carbon dioxide from tissues to the lungs. (10 marks)

12. Illustrate the tricarboxylic acid (TCA) cycle. (20 marks)

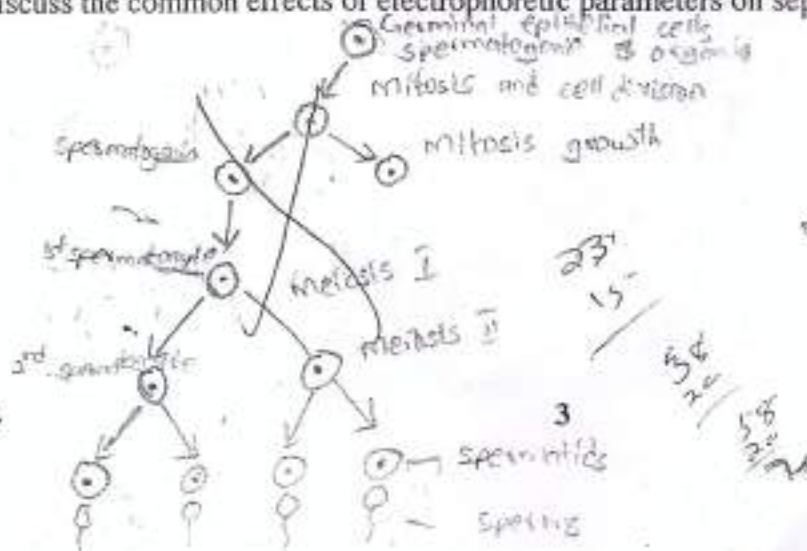
set of rxn that takes place in cytoplasm of eukaryotes & prokaryotes

13. With the aid of diagrams, describe the development of a mature embryo sac. (20 marks)

once the pollen grain lands on the stigma it germinates. A pollen tube emerges from one of the pores and grows rapidly down the style in ovary. Growth is controlled by tube nucleus of pollen grain.

- (a) With aid of a diagram illustrate the transmission across the synapse. (10 marks)
- (b) Draw a labelled diagram of a human spermatozoon. (10 marks)

15. Discuss the common effects of electrophoretic parameters on separation of amino acids. (20 marks)



23  
15  
3  
56  
20  
56

Diglycerate ATP ADP  
2NAD  
2NADH 2H<sup>+</sup>