

NAME _____ ADM. NO. _____ CLASS _____
INDEX NO. _____ CANDIDATES SIGNATURE _____ DATE _____

1/2
BIOLOGY
PAPER 2
JULY 2016
TIME: 2 HOURS



**Kenya Certificate of Secondary Education
Mock Examinations
Biology
Paper 2
2 Hours**

Instructions To Candidates

Write your name and index no., Class, Signature and Date in the spaces provided above.

This paper consists of **TWO** sections. **A** and **B**

Answer **ALL** questions in section as in the spaces provided.

In section B answer **question 6(compulsory)** and **EITHER** question **7** or **8** in the spaces provided after question 8.

Examiners Use Only

Section	Question	Maximum Score	Candidates Score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
TOTAL		80	

This paper consists of 10 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)

1. In an experiment, an equal number of red blood cells were incubated for one and a half hours in salt solutions of different concentration. After the incubation, the number of red blood cells in each set up was determined and the following results were obtained.

Set up	Salt concentration	Number and shape of red blood cells after incubation
I	1%	Number remained the same and no change in shape
II	0.6%	Fewer red blood cells that are bigger in size
III	0.4%	No red blood cells counted

(a) Name the physiological process being investigated. (1mk)

(b) Account for the results in set up I and III

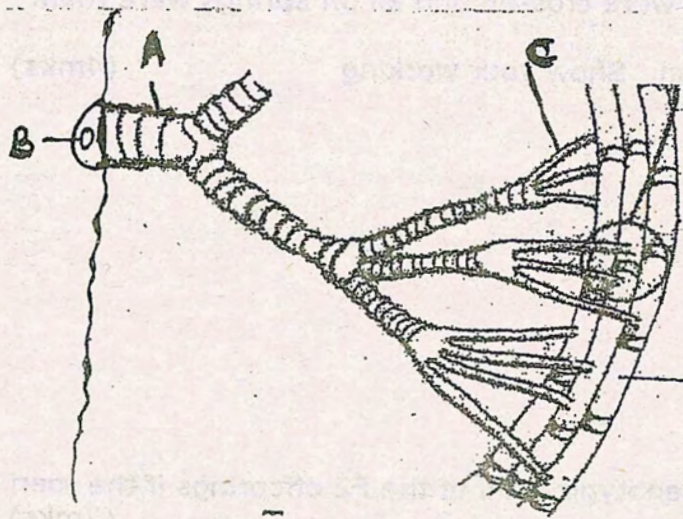
(i) Set up I (2mks)

(ii) Set up II (2mks)

(c) What observations would you expect to make on the cell shape of red blood cells if the experiment was repeated with salt solution whose concentration is 1.5% (2mks)

(d) What is the importance of oxygen gas in the process of active transport in cells (1mk)

2. The diagram below is part of the tracheal system of a grasshopper



- (a) Name the structures labeled (2mks)

A _____ B _____

- (b) State one way in which structure C is adapted to its functions (1mk)

- (c) Describe how carbon (IV) oxide gas moves from the tissues of the insect to the atmosphere (3mks)

- (d) Explain why a fish dies when taken out of the water after sometime. (2mks)

3. In cattle the gene for red colour is represented by letter r and that of white colour as W . A red bull and a white cow were crossed and all off springs were roan.

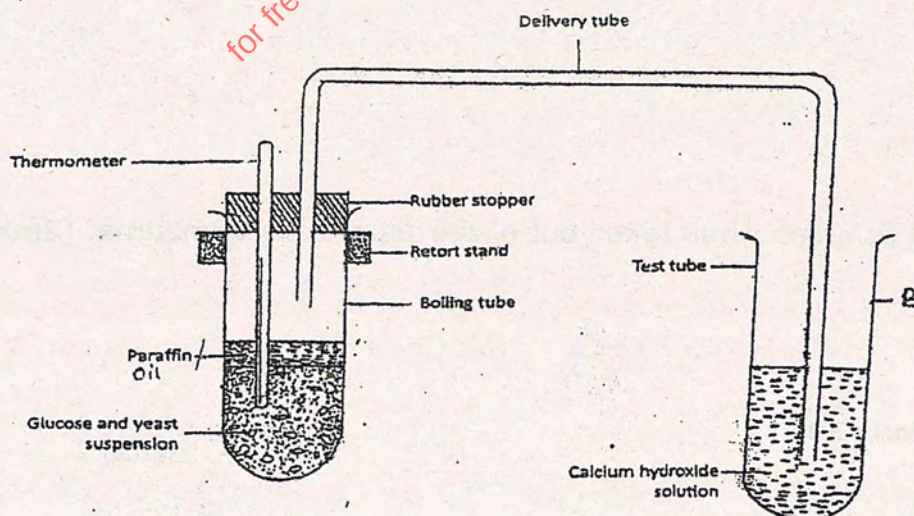
(a) Determine the F_1 generation. Show your working (4mks)

(b) State the genotypic and phenotypic ratio of the F_2 offsprings if the roan offsprings were selfed (2mks)

(c) Explain why neither a bull with red colour nor a cow with white colour appeared but a roan in the F_1 generation (1mk)

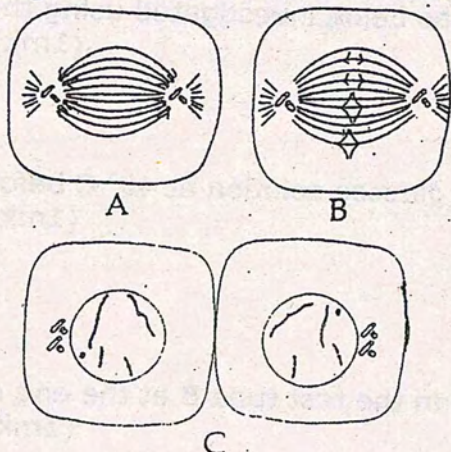
(d) Name the molecule that carries genetic information in eukaryotic cells (1mk)

4. The diagram below shows a set up to demonstrate a certain physiological process. The glucose solution was boiled and oil added on top of it. The glucose solution was then allowed to cool at 40°C before adding the yeast.



- (a) Identify the physiological process that was being investigated using the above set up (1mk)
- (b) What was the importance of cooling the glucose solution at 40° C before adding yeast suspension (1mk)
- (c) (i) What observation would be made in the test tube B at the end of the experiment (1mk)
- (ii) Explain the observations made (1mk)
- (d) What observation would be made in (c) above if oil was not added on top of the yeast suspension (1mk)
- (e) During an investigation, an organism was found to use 145cm³ of oxygen to give a respiratory quotient of 0.7 during an activity.
- (i) Name the type of food respired (1mk)
- (ii) Give one reason why the food substance identified in e(i) above is the main respiratory substrate (1mk)
- (iii) Determine the volume of carbon (IV) oxide produced. (1mk)

The diagram below shows the stages of cell division



(a) With reasons, identify the stage labeled

A

(1mk)

Reason

(1mk)

(b) How is stage B above different from the same stage in meiosis 1 (1mk)

(c) What brings about the separation of the daughter cells in stage marked C in

(i) Animals

(1mk)

(ii) Plants

(1mk)

(d) Name two cell structures that are present in a cell during interphase but absent in prophase (2mks)

(e) State the significance of mitosis in organisms

(1mk)

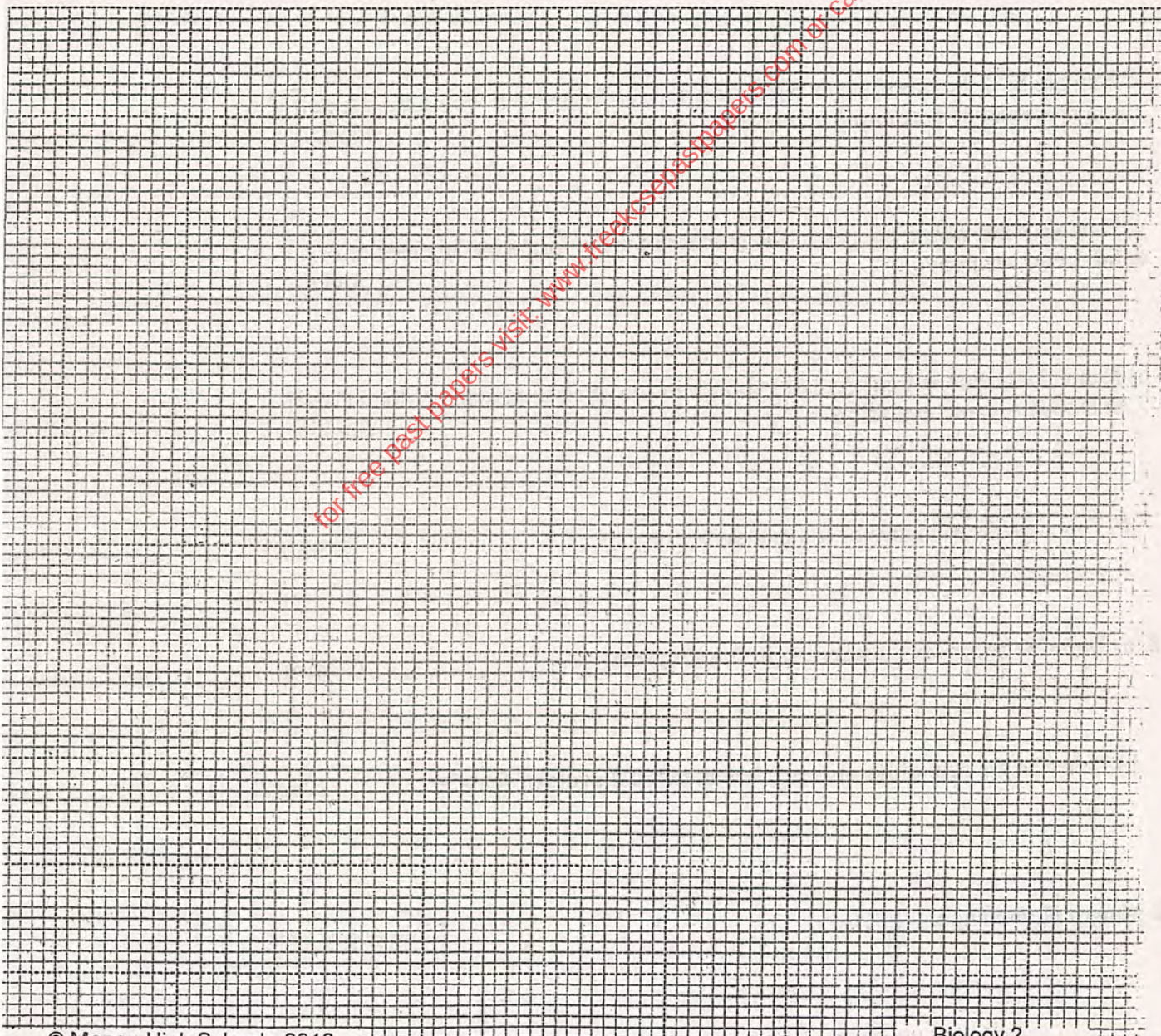
Section B (40 Marks)

Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided.

6. In an experiment, three healthy rats were fed on equal amounts of carbohydrates. After one hour the glucose concentration in the blood was measured at 30 minutes intervals of three hours. The results were as shown in the table below.

Time	Initial	30 min	60 min	90 min	120 min	150 min	180 min
K	1.59	1.52	1.46	1.35	1.31	1.20	1.12
L	1.50	1.43	1.38	1.33	1.29	1.21	1.10
M	1.56	1.44	1.36	1.30	1.20	1.09	1.00
Mean Glucose Concentration	1.55	1.46	1.40	1.33	1.27	1.17	1.07

- (a) On the grid plot a graph of mean glucose concentration against time (6mks)



- b) Calculate the mean glucose concentration in the blood after 45 minutes (1mk)
- c) Why was it necessary to use more than one experimental animal in the experiment (1mk)
- d) Suggest factors that may have contributed to variation in the initial concentration of glucose. (2mks)
- e) Accounts for the differences in mean glucose concentration during the period (3mks)
- f) Explain how the blood sugar regulation and food digestion would be affected if pancreatic duct of a mammal is blocked (3mks)
- g) Explain what would happen to the process of urine formation in absence of antidiuretic hormone. (3mks)
- h) Name the hormone that regulates concentration of sodium ions in blood (1mk)
7. a) Define organic evolution (2mks)
- b) Describe the evidence of organic evolution (18mks)
8. a) Describe secondary thickening in woody plants (10mks)
- b) Describe the role of hormones in the menstrual cycle of female (10mks)