

231/3
BIOLOGY
PAPER 3
(PRACTICAL)
TIME: 1¼ HRS
JULY / AUGUST 2014

MAKINDU DISTRICT INTER- SECONDARY SCHOOLS EXAMINATION

Kenya Certificate of Secondary Education

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BIOLOGY
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INSTRUCTIONS TO SCHOOLS

The information contained in this paper is to enable the head of the school and the teacher in charge of biology to make adequate preparations for this year's mock biology practical examination. NO ONE ELSE should have access to this paper or acquire knowledge of its contents. Great care should be taken to ensure that the information contained herein DOES NOT reach the candidates either directly or indirectly. The teacher in charge of biology should NOT perform any of the experiment in the same room as the candidates nor make the results of the experiment available to the candidates or give other information related to the experiment to the candidates.

CONFIDENTIAL REQUIREMENTS

Each candidate will require the following

- Glucose 10%+Ascorbic acid(fruit juice)-10ml
- Benedict's solution
- DCPIP reagent
- Dilute NaOH
- 1% copper (II) sulphate

NAME DATE

INDEX NO. SIGNATURE

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INSTRUCTIONS TO CANDIDATES

- Answer **all** the questions.
- You are required to spend the first 15 minutes of the 1¾ hours allowed for the paper reading the whole paper carefully before commencing your work.
- Answers must be written in the spaces provided in the question paper.
- Additional pages must not be inserted.
- Candidates may be penalized for recording irrelevant information and for incorrect spellings.
- This paper consists of 5 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

FOR EXAMINER'S USE ONLY

Questions	Maximum score	Candidate's score
Question 1	12	
Question 2	14	
Question 3	14	
Total score	40	

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231/3
Biology
Paper 3 (practical)

1. You are provided with solution labeled Q, Benedict's solution, DCPIP reagent, dilute sodium hydroxide and 1% copper (II) sulphate; Using

a) 2ml in a test-tube in each case, test for the food substances in solution Q (10mks)

Test	Procedure	Observation	Conclusion
Burette Test	(1mk)	(1mk)	(1mk)
DCPIP test	(1mk)	(1mk)	(1mk)
Benedicts test	(1mk)	(1mk)	(1mk)

b) Name the deficiency disease in humans that would result from lack of nutrients contained in solution Q (1mark)

.....
.....

c) In the study of evolution researchers have observed that vertebrate's animals have the type of structures shown below.

SEE PHOTOGRAPHS ATTACHED

i. Which theory of evolution do these structures support? (1mark)

.....
.....

ii. On the diagrams identify the basic similarities observed. (2marks)

.....
.....
.....

iii. Explain clearly why this structure justify evolution in animals (3marks)

.....
.....
.....
.....

2. The micrograph below shows stages in a type of cell-division that occurs in organisms.

SEE PHOTOGRAPHS ATTACHED

a) State the type of cell – division (1 mark)

.....
.....

b) Identify the stages indicated by letter. (4marks)

V
.....

X.
.....

Y
.....

Z
.....

c) Name the type of cells in which the above process occurs.

.....
.....
.....

d) State two significance of this type of cell-division

(2marks)

.....
.....
.....

e) From the micrograph, suggest with reason(s) whether the cell-division shown occurred in plants or animals

(2marks)

.....
.....
.....

f) Name one cellular activities that occurs in stage labeled W

(1mark)

.....
.....
.....

3. Below are drawing of various organisms. Examine them

SEE PHOTOGRAPHS ATTACHED

a) i) Name the phylum to which B belongs

(1mark)

.....
.....
.....

(ii) Give three reasons for your answer in (a) (i) above

(3marks)

.....
.....
.....
.....
.....

b) Name the class to which specimen B and E belong.

B

.....

E

.....

c) Give three differences between specimen B and E (3marks)

.....

d) Use the dichotomous key provided to identify the organism.

- 1. a) Jointed legs present..... go to 2
- b) jointed legs absent..... go to 7
- 2. a) Have 3 pairs of legs..... go to 3
- b) Have more than 3 pairs of legs..... go to 5
- 3. a) With wings..... go to 4
- b) Without wings..... Anoplura
- 4. a) Have one pair of wings..... Diptera
- b) Have two pairs of wings..... Hymenoptera
- 5. a) Have four pairs of legs..... Arachnida
- b) Have more than 10 pairs of legs..... go to 6
- 6. a) With one pair of legs per segment..... Chilopoda
- b) With two pairs of legs per body segment..... Diplopoda
- 7. a) With body enclosed in a shell..... Mollusca
- b) Body surface with spiny projections..... Echnodermata.

Identify steps followed to identify organism A, B, C, and E (5marks)

Specimen	Steps followed	Identity
A		
B		
D		
E		

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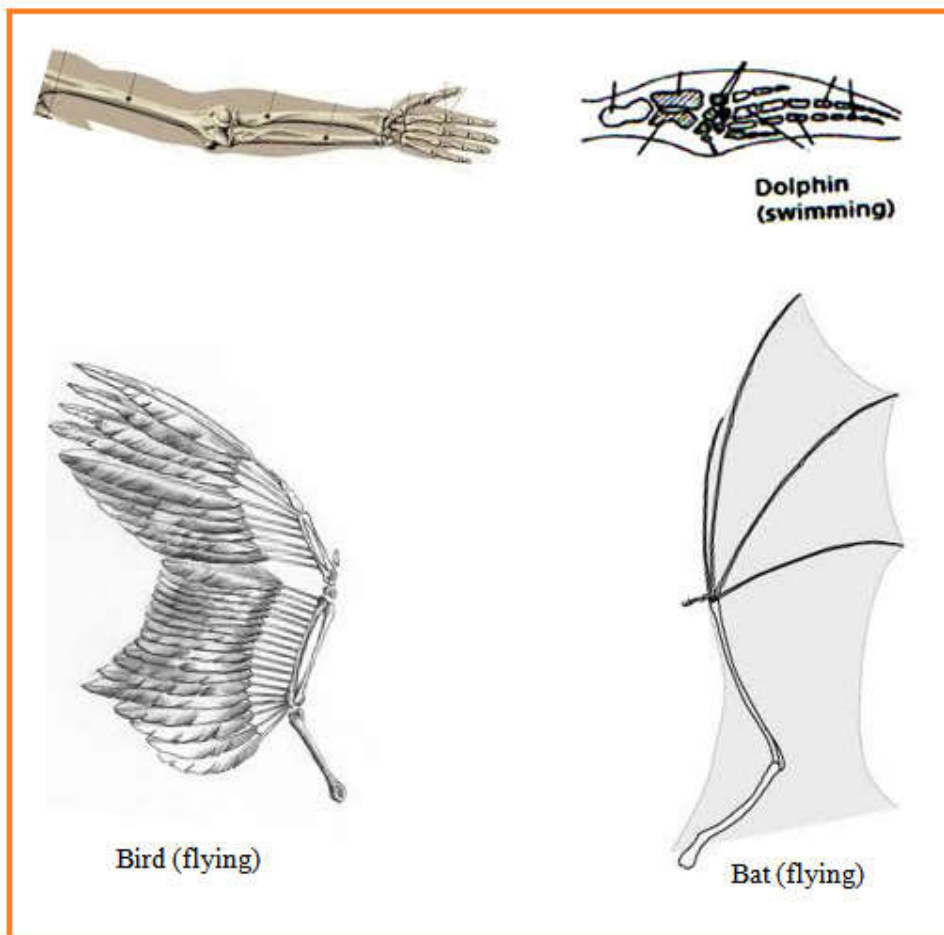
BIOLOGY

PAPER 3

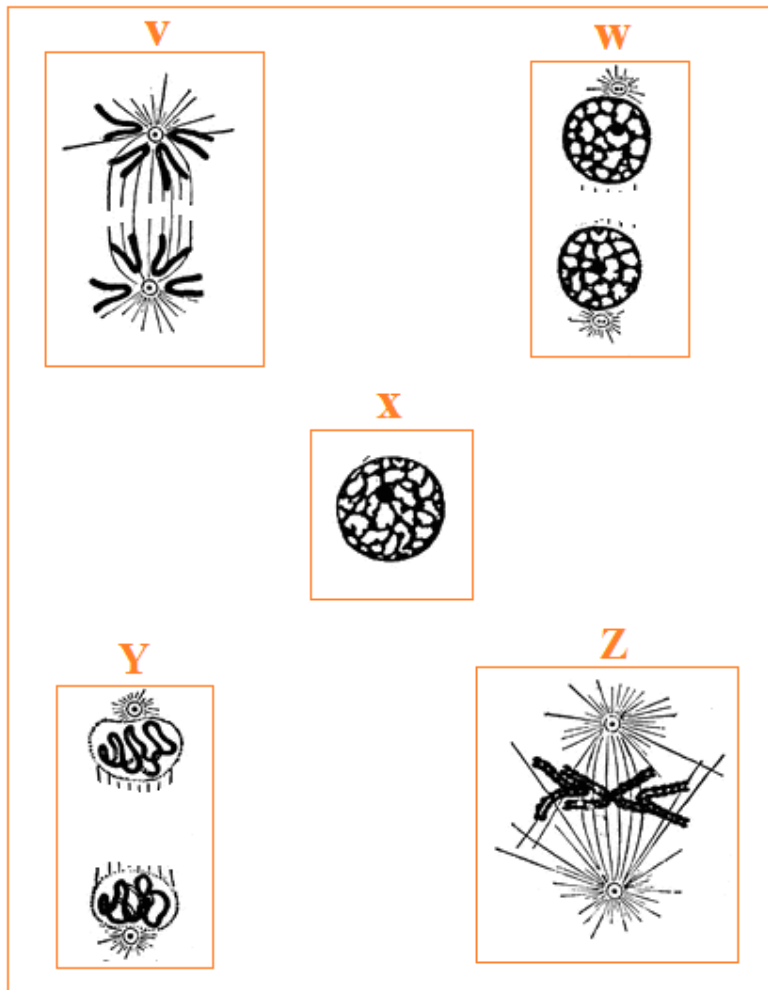
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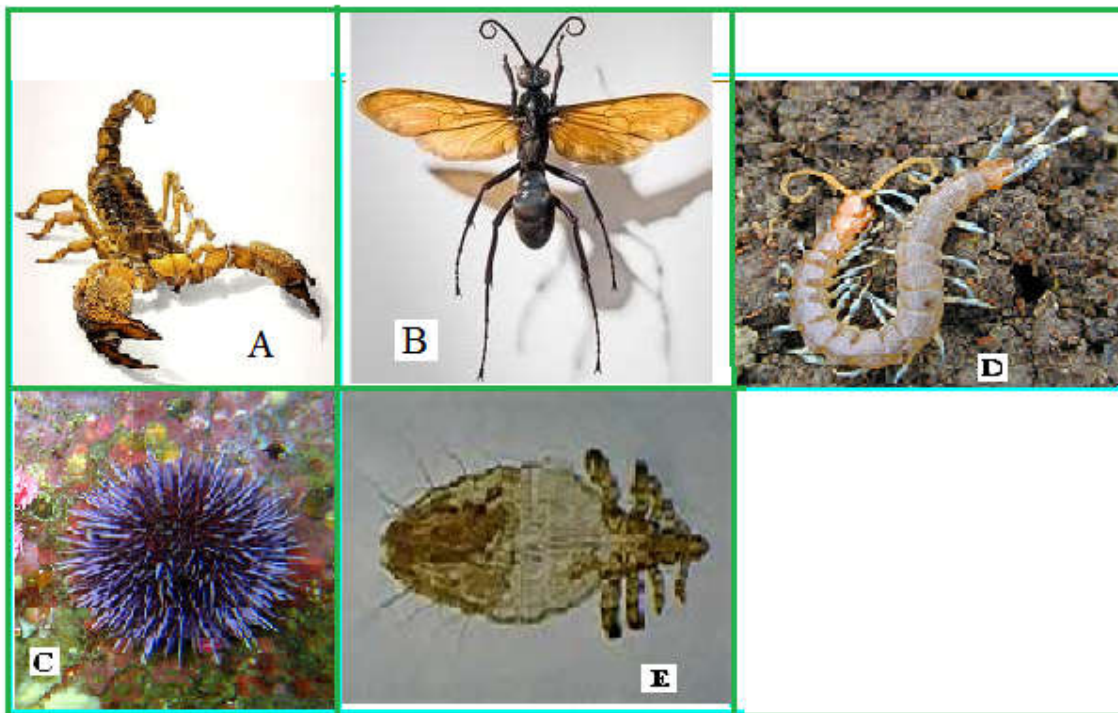
QUESTION 1. C PHOTOGRAPHS



QUESTION 2 PHOTOGRAPHS



QUESTION 3 PHOTOGRAPHS



MAKINDU DISTRICT INTER - SECONDARY SCHOOLS EXAMINATION**BIOLOGY****PAPER 3****MARKING SCHEME**

Test	Procedure	Observation	Conclusion
Biurette	To 2ml of soln Q, in the test-tube, and 2ml of NaoH soln. followed by drops of 1% CuSO ₄ (1mk)	No observable colour changes (1mk)	Protein absent (1mk)
DCPIP test	To 2ml of DCPIP in the test-tube add solution Q drop wise(1mk)	Blue –colour of DCPIP is decolorized(1mk)	Ascorbic acid/vitamin C present (1mk)
Benedict's test	2ml of solution Q, add 2ml of Benedict soln and heat to boil.(2mks)	The colour changes from blue-green-yellow-orange/brown (1mk)	Reducing sugars present (1mk)

NB; If candidate errors in procedure; don't award for observation and conclusion.

The sequence of reagents .i.e. NaoH followed by CuSO₄ must be followed

b) Marasmus/kwashiorkor

c)

i. Organic evolution

ii. Identify:

- humerus
- Ulna/radius
- Carpals
- Metacarpals
- Phalanges

(Indicate in all diagrams) (2mks)

iii. Homologous

- All the structures have pentadactyl (5 digit) plans pointing to one origin but evolved to perform different functions due to demands of different environments in which they live (diversity)

2. a) Mitosis/mitotic cell division (1mk)

b) V -Anaphase/late metaphase (1mk)

X -prophase (1mk)

Y -telophase (1mk)

Z -Metaphase (1mk)

c. Somatic/body cells (1mk)

d.

- Growth and development;
- Forms the basis of asexual reproduction
- Ensures chromosome numbers and genetic constitution of the daughter cell is the same as that of the parent; (2mks)

e. Plants

Reason: Formation of middle lamella separating two daughter cells

Accept: lack of centrioles.

f. -Replications of chromosome

-Synthesis of new organelles

-Synthesis of energy/Building up of (ATP) energy.(1mk)

3. a) B-Arthropoda

Reason

- Has exoskeleton
- Jointed appendage
- Segmented body
- Has compound eye
- Has antennae

b. B-Insecta

E-Arachnida

c)

B	F
Has wings	Wings absent
3 body parts	2 body parts
Large compound eyes	Small compound eyes
Long antennae	Short antennae

d)

organism	Steps followed	Identity
A	1a,2b,5a	Arachnida
B	1a,2a,3a,4b	Hymenoptera
D	1a,2b,5b,6a	Chilopoda
E	1a,2a,3b	Anoplura