Name: …… Index Number…….

231/1 Candidate's Signature…….
BIOLOGY
Paper 1 Date: ……
(THEORY)
2 hours

KENYA NATIONAL EXAMINATIONS COUNCIL
Kenya Certificate of Secondary Education
BIOLOGY
Paper 1
(THEORY)
2 hours

Instructions to candidates

(a) Write your name and index number in the spaces provided above
(b) Sign and write the date of examination in the spaces provided above
(c) Answer ALL the questions in the spaces provided
(d) This paper consists of 11 printed pages
(e) Candidatures should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing

Examiner's use only

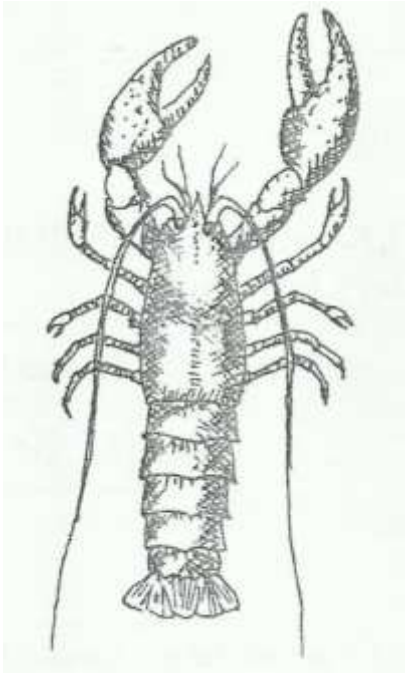
Question	Maximum Score	Candidate's Score
1 - 30	80	

1. How does nutrition as a characteristic of living organisms differ in plants and animals? (2 marks)

……..

……

2. The diagram below represents a certain organism collected by a student at the sea shore.



(a) Name the class to which the organism belongs. (1 mark)

……..

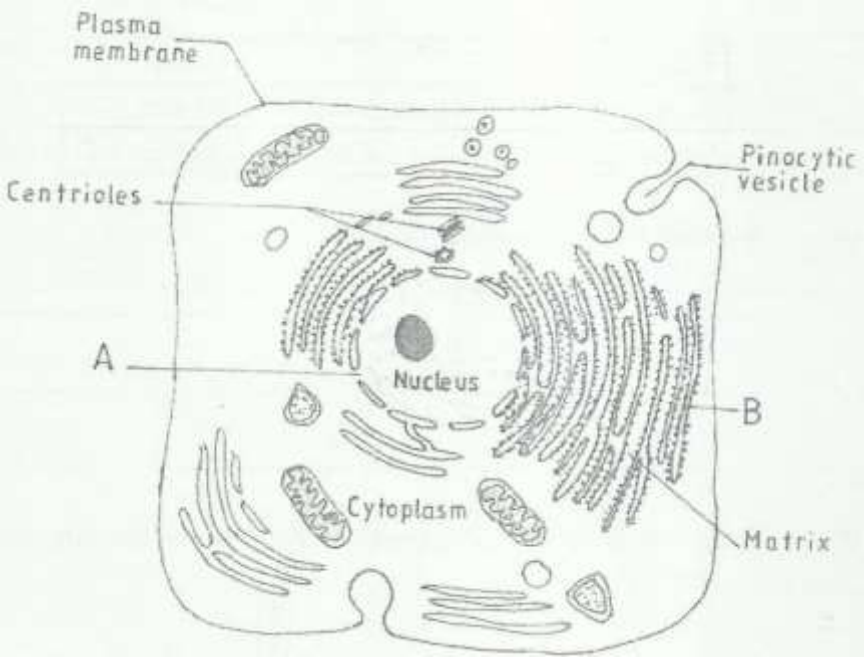
(b) Give three reasons for your answer in (a) above. (3 marks)

……

……

……

3. The figure below is a fine structure of a generalized animal cell as seen under an electron microscope.



(a) Name the parts labeled A and B. (2 marks)

A ……

B ……

(b) How is the structure labeled B adapted to its function? (2 marks)

……

……

4. In an investigation, a student extracted three pieces of paw paw cylinders using a cork borer. The cylinders were cut back to 50mm length and placed in a beaker containing a solution. The results after 40 minutes were as shown in the table below.

Feature	Result
Average length of cylinders (mm)	56 mm
Stuffiness of cylinders	Stiff

(a) Account for the results in the table above. (3 marks)

……

……

……..

(b) What would be a suitable control set-up for the investigation? (2 marks)

……

……..

5. The table below shows results of a study of three plants C, D and E growing in different habitats.

Feature	Plant C	Plant D	Plant E
Number of stomata on upper surface of leaf per square area	4	20	6
Number of stomata on lower surface of leaf per square area	6	0	8
Thickness of leaf cuticle (mm)	0.4	0.1	0.2
Surface area of roots (cm^3)	2000	1000	1200

(a) Which one of the plant C, D and E grows in an area of relatively low water availability? (1 mark)

……

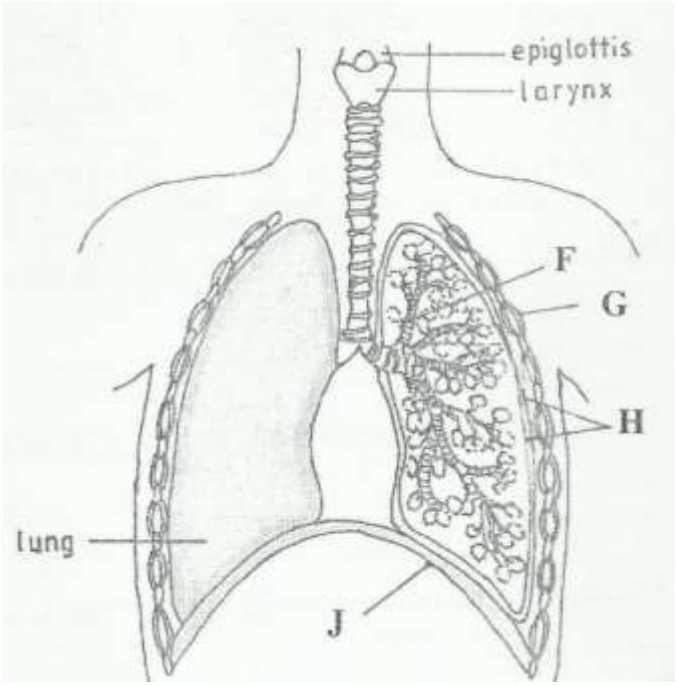
(b) Explain your answer in (i) above. (3 marks)

……..

……

……

6. The diagram below represents par of the gaseous exchange system in human.



(a) Name the parts labeled F and G. (2 marks)

F ……

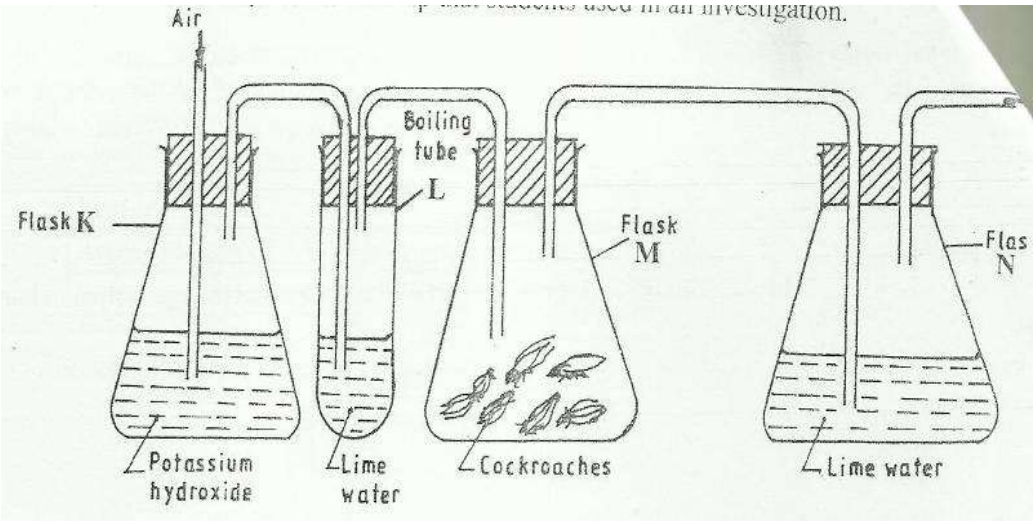
G ……

(b) State one function of each of the parts labeled H and J (2 marks)

H ……

J ……

7 The diagram below represents a set-up that students used in an investigation.



(a) Name the physiological process that was being investigated. (1 mark)

……

(b) State the role of potassium hydroxide in flask K. (2 marks)

L ……..

……

N ……

……

8. What is the probability of a couple with blood group AB getting a child with blood group AB? Show your working. (4 marks)

……..

……

……

……..

9. State the importance of negative phototaxis to termites (1 mark)

……..

……

10. What is meant by the term irritability? (1 mark)

……..

……

(b) Name the muscles found in the following organs: (2 marks)

Stomach; …….

Bone …….

12. (a) Name the part of light microscope used to bring an image of a specimen into sharp focus. (1 mark)

……

13. State three factors that affect the rate of diffusion. (3 marks)

……..

……

……

14 (a) Name the type of respiration that is most efficient (1 mark)

……

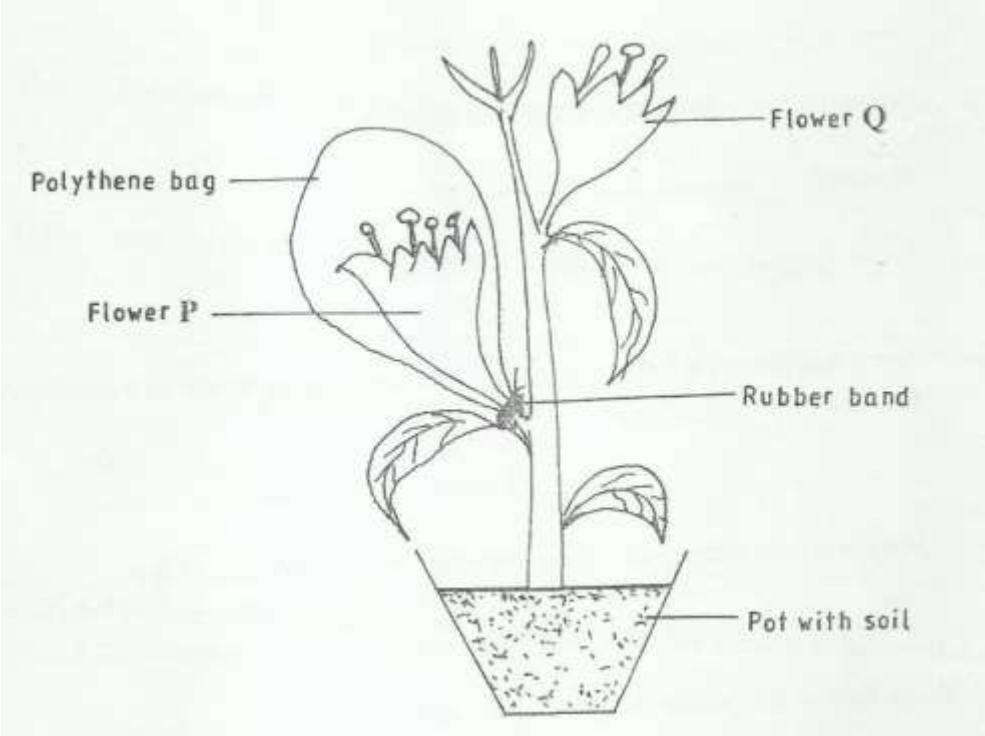
(b) Given a reason for your answer in (a) above (1 mark)

……

15 What name is given to a group of hormones that controls the development of secondary sexual characteristics in a human male? (1 mark)

……

16. The diagram below represents an experimental set-up used by students to investigate a certain process.



Flower Q produced seeds while P did not. Account for the results.
(3 marks)

……

……..

17. Name two substances that leave the foetal blood through the placenta (2 marks)

……

……..

18. Why are plants able to accumulate most of their waste products for long? (1 mark)

…….

19. List four symptoms of diabetes mellitus (4 marks)

……

……..

……

……..

20. State three aspects that can be used to estimate growth in seedlings. (3 marks)

……

……..

……

21. Name the process through which free atmospheric nitrogen is converted into nitrates. (1 mark)

……..

22. State the importance of divergent evolution to organisms (2 marks)

……..

……

23. Name the strengthening materials found in the following support tissues: (2 marks)

(a) collenchyma; ……

(b) xylem.…….

24. State four characteristics of apical mieristem cells (4 marks)

……..

……

……..

25. State the role of the following hormones in the life cycle of insects: (2 marks)

Ecdysone hormone; ……..

……..

Juvenile hormone …….

……..

26. (a) State the theories of evolution proposed by the following scientists (2 marks)

Charles Darwin …….

……

Jean-Baptiste de Lmarck……

……

(b) State the evidence of evolution based on (2 marks)

(i) cell organelles……

……

(ii) fossils……

……..

27. What is the function of contractile vacuoles in amoeba? (1 mark)

…….

28. State two differences between open and closed circulatory systems (2 marks)

……

……

29. Name two nutrients that are absorbed without being digested by enzymes in humans. (2 marks)

……

……

30. Name the organelle that is involved in each of the following: (2 marks)

(a) manufacture of lipids ……

(b) formation of lysosomes……

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KCSE 2012 BIOLOGY P1 MARKING SCHEME

1 Plant make their won food from carbon (iv) oxide and water in the presence of flight/photosynthesis autotrophic, while animals cut ready made food (from plants and animals heterotrophic 2mks

2 a) Crustaceae, ace crustacean 1mk

b) Head fused with thoras thus cephelothorax;

- Have compound eyes/ a pair of compound eyes;
- Have five pairs of limbs/ 5-20 pairs of limbs,
- Have external gills;

3a nucleapore/ nucleur pore;
Rough endoplasmic reticulum

b) surface area covered with ribosome's; for protein synthesis/ channels for transport of protein

4a) the solution was hypotonic/less concentrated compared to the cell sap of pawpaw cylinder cells/cell sap hypertonic to the solution
The tissue/ cells grained water by osmosis becoming turgid/longer/stiff

b) Paw paw cylinder of the same size/length; placed in isotonic solution;
Boiled paw paw cylinders of same size/lengths; placed in isotonic solution;

5a) plant c 1mk

b) Thick cuticle reduces water loss 3mks
low number of stomata reduces water loss/leased number of stomata on upper surface reduces water loss;
large root surface area enhances water absorption

6a) F -bronchiole
G- Intestinal muscles/external intestinal muscle;
Internal intercostals muscles

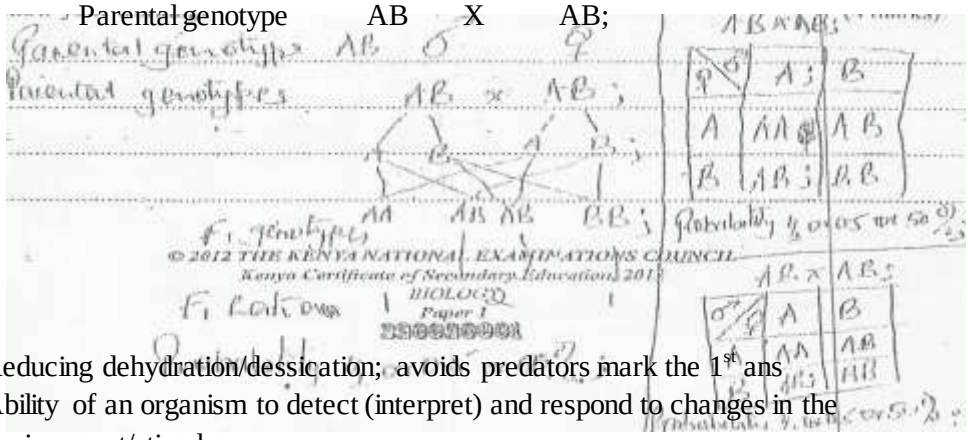
b) (Pleural membranes) secrets/encloses pleural fluid to lubricate/protein lungs
Diaphragm separates chest cavity from abdominal cavity/work to effect volume/pressure changes in chest cavity necessary for inhalation and exhalation (ventilation,

7. a) Respiration

b) Potassium hydroxide) removes/absorbs CO_2 (From atmospheric air) AIC CO_2

c) L- Lime water remain clear because carbon (iv) oxide has been removed
N- Lime water forms a white ppt/tinbid because the respiring produce carbon (iv) oxide

8. a) Parental genotype AB O Q
   Parental genotype AB X AB;



9. Reducing dehydration/dessication; avoids predators mark the 1st ans
10. Ability of an organism to detect (interpret) and respond to changes in the environment/stimulus;
11. a) Contract consciously without fatigue
    Their contraction is stated by the muscles themselves
    b) Smooth
    Skeletal
12. a) fine adjustment knob s
    b) Avoid refraction of light
    Prevent wetting of the stage
13. Temperature, surface and thickness of membranes/changes that particles have to travels diffusion/concentration gradient, size/density of molecules medium of diffusion surface area to ratio
14. a) Aerobic respiration 1mk
    b) Releases more energy (per unit mass) 1mk

15 Androgens
Acc-androgen

16 The flower/plant is self sterile (not successfully self pollination covering prevents pollution in flower P, Flower Q received pollen grains from other plants/cross pollination

17 Carbon (IV) oxide nitrogenous waste

18 Most of the wastes products are harmless
Converted into harmless products

19 Passing urine frequently/polyvia; glucose/excess glucose in urine/common feeling of thirst/dehydration; excess glucose in blood hyperglycemia loss of weight excess eating; poor
Resistance to diseases;
Excessive eating/polyphagia thy hyperphagia;

20 Height/length, weight mass/surface area

21 Nitrogen fixation

22 Results in adaptation that enable organisms to exploit different ecological niches leads to the formation of new species/speciation;

23 a) Cellulose
   b) Lignin

24 small/ central/prominent nucleus; dense cytoplasm; no vacuoles; continuous/rapidly thin cell walls

25 cause metamorphosis (forwards adult stage)cause moulding/ecdysis
Maintains caval characterists/cause formation of larval cuticle/inhibits moulding/metamorphosis

26. a) Theory of environmental influence on inherited characteristics inheritance of acquire
characteristic

b) i) Similar organelles performing similar functions different organisms suggests a common ancestry/

ii) Fossils records/paleontology

Acc. By controlling the fossils of different organism its possible to the phylogenetic between organism/common ancestry

27 Removes excess water/waste products/homeostatis/osmoregulation excretion
Lack of pigment for transport of 0_2 and $C0_2$/Blood has pigment for transport of 0_2 and CO_2

28 Blood flowsin haemo/ blood confined in vessels body cavity/coelum

29 water; mineral ions/salts, vitamins

30 a) Smooth endoplasmic reticulum,

b) Golgi bodies/Golgi apparatus