

FORM FOUR CLUSTER KCSE MODEL14

BIOLOGY PAPER 3 QUESTIONS

1. You are provided with a specimen labelled L. Obtain three cubes from the specimen with the following dimensions. CELL PHYSIOLOGY
- Cube L1 with sides measuring 0.5cm.
 - Cube L2 with sides measuring 1.0cm
 - Cube L3 with sides measuring 1.5cm
- a) Work out the surface area to volume ratio in each case of the cubes labeled L1, L2 and L3. (3mks)
- b) Immerse the cubes into the iodine solution provided in a beaker. Allow the set up to stand for 30 minutes.
Remove the cubes from the iodine solution using a pair of forceps.
- Dry the cubes using the blotting paper provided.
- i) Record your observation (½ mk)
- ii) Give a conclusion for your observation made in
- (b) (i) above (½ mk)
- iii) Cut the cubes in each case into two equal halves.
- Record the observations made in the cubes labeled L1 and L3
- . iv) Account for the observations made in (b) (iii) above (2mks)
- c) You are provided with a liquid labelled R and sodium hydrogen carbonate in two separate test tubes.
- Place a drop of liquid R on the filter paper provided. Pass the filter paper over a Bunsen flame, taking care not to burn it.
- i) Record your observation. (1mk)
- ii) Suggest the identity of liquid R. (1mk)
- iii) Why was the filter paper passed over the Bunsen flame? (1mk)
- d) Add all the sodium hydrogen carbonate solution into the remaining liquid R in a test tube.
- Shake the mixture thoroughly.
- i) Record your observation (1mk)
- ii) Account for the observation made in (d) (i) above (1mk)
- iii) State the significance of the process being investigated. (1mk)
- iv) Name the secretion in the human body that functions as sodium hydrogen carbonate on liquid R. (1mk)
2. a) The photographs below shows bones that were obtained from a mammal

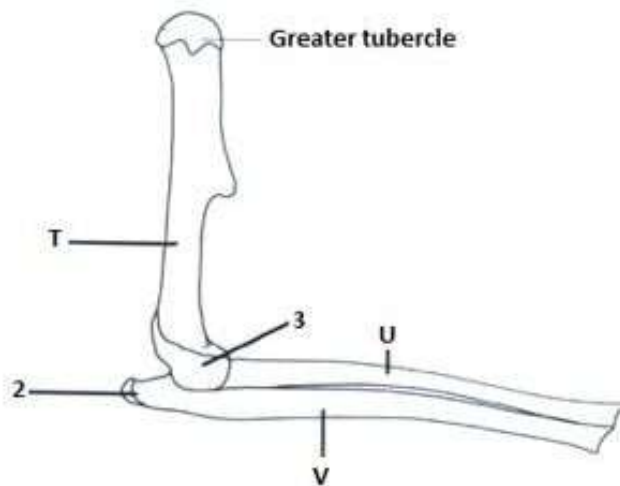
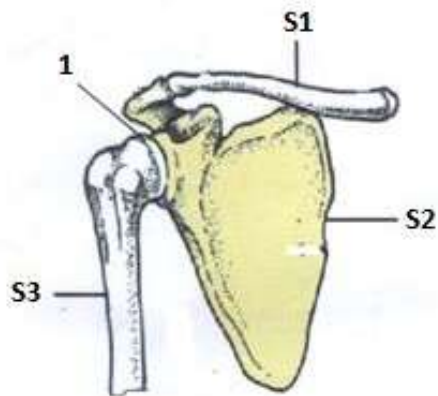


FIG VII

i) Identify the bones labelled S1, S2 and S3. (3mks)

S1.....

S2.....

S3.....

ii) Give one adaptation of the bone labelled S2 to its function (1mk)

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iii) State one function of the part labelled 2 in figure VII. (1mk)

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iv) Give one difference between the type of joint that is formed at the parts labelled 1 in figure VI and 3 in figure VII. (1mk)

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v) Name the part of the body where the bones labelled U and V are found. (1mk)

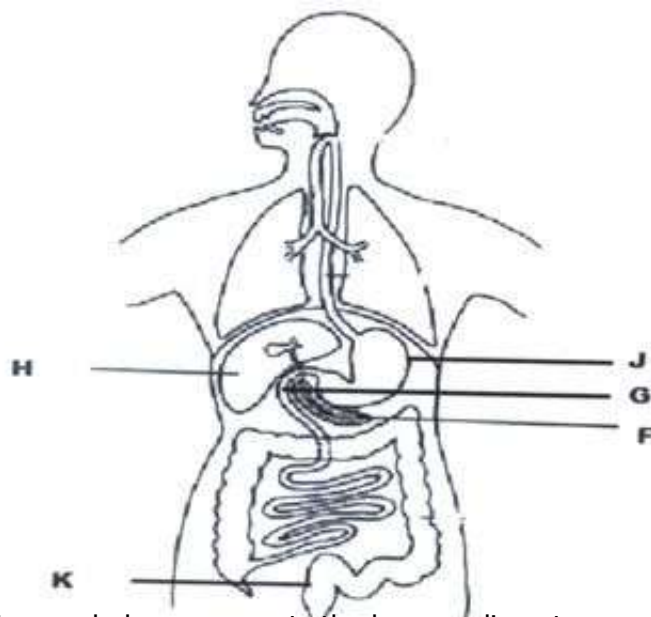
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vi) Measure the length of the bone labelled T _____cm. (1mk)

vii) The actual length of the bone labelled T is 8.4cm. Work out the magnification of the figure labelled VII. (1mk)

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b) The diagram below represents the human alimentary canal

i) Name the part labeled G. (1mk)

.....

.....

ii) In each case, name one component of the digestive juices produced by the organs labelled H and J. H. (1mk)

J. (1mk)

iii) State the function of the part labeled K. (1mk)

.....

.....

iv) The organ labeled F is referred to as a "double gland". Explain (1mk)

.....

.....

b) The diagram below represents the human alimentary canal

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J. (1mk)

iii) State the function of the part labeled K. (1mk)

.....

.....

iv) The organ labeled F is referred to as a "double gland". Explain (1mk)

.....

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3. a) The photograph below shows a response that is exhibited by climbing plants.



FIGURE III

i) a) Name the plant organ labeled W. (1mk)

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b) The plant response demonstrated in the photograph. (1mk)

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ii) Account for the change in shape the organ labeled W will undergo to coil. (4mks)

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b) Below is a photograph showing structures that are found on the roots of a legume.



FIGURE IV

Identify the structures labeled X (1mk)

i)

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ii) Name the organisms that lives in the structures labeled X. (1mk)

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iii) State the role of the organisms named in (b) (ii) above in the ecosystem. (1mk)

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iv) Give two benefits that the organisms named in (b) (ii) above derives from the legume. (2mks)

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v) The association between the organisms named in (b) (ii) above and the legume is referred to as (1mk)

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(a) (i) •Tendril;(1mk)

•Thigmotropism/Haptotropism ;(1mk)

(ii) High concentration of auxins; on the side away from contact surface;

promotes faster growth of this side; causing tendril to curl/coil round the object;

(b) (i) Root nodules/Root tubercles;(1mk)

(ii) Rhizobium sp bacteria.(1mk) Acc.Rhizobium leguminosarum

(iii) Nitrogen fixation ;(1mk)

(iv) —Food ;(1mk)

—Shelter ;(1mk)

(v) Symbiosis/mutualism ;(1mk)