NAME----------ADM. NO----------CLASS-------

KIKUYU SUBCOUNTY TRIAL MOCK TERM III 2017
FORM 3

TIME: 2HRS

INSTRUCTIONS: ANSWER ALL THE QUESTIONS

SECTION A

1. a) What is meant by the following ecological terms?
   i) Population (1 mk)

   _____

   _____

   ii) Community (1 mk)

   _____

   _____

   iii) Ecosystem (1 mk)

   _____

   _____

   b) What is the importance of the following in an ecosystem?
   i) Decomposers (1 mk)

   _____

   _____

   ii) Predation (1 mk)

   _____

   _____

   c) Give a reason why two species in an ecosystem cannot occupy the same niche. (2 mks)

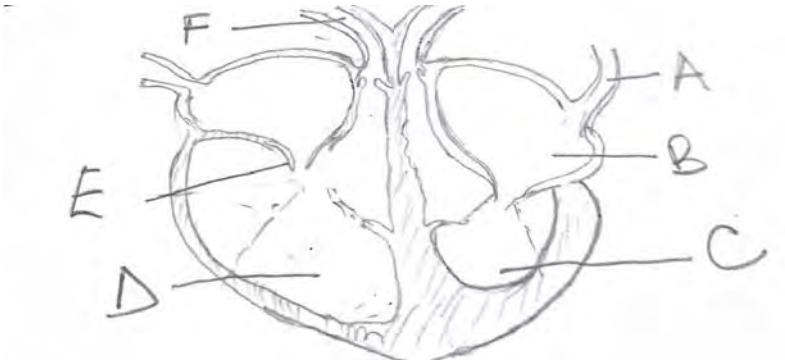
   _____

   _____

   d) Name the bacteria found in the root nodules of leguminous (1 mk)

   _____

2. The diagram below shows a vertical section through a mammalian heart.



a) Name the parts labeled A, B, E and F (4 mks)

A _____

B _____

E _____

F _____

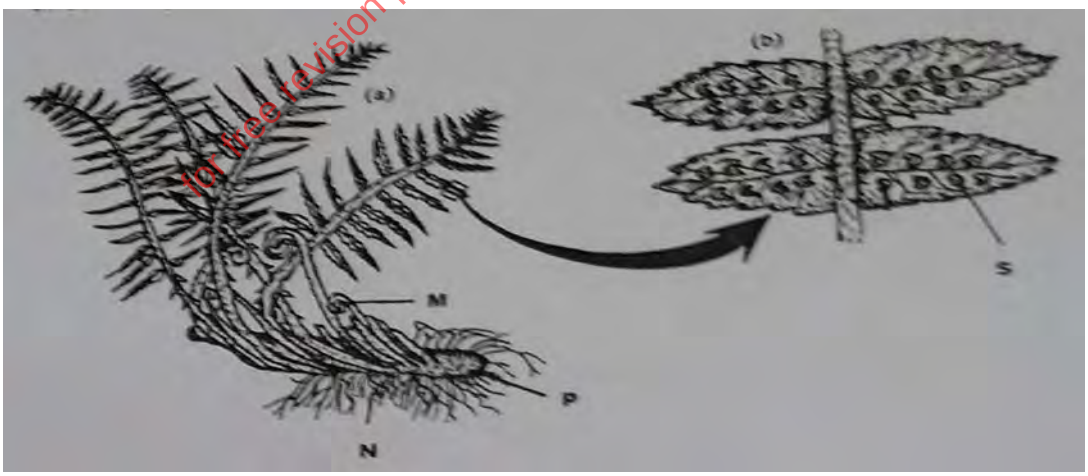
b) Use arrows to show the direction in which blood flows in the heart. (2 mks)

c) Give a reason why the wall of chamber C is thicker than chamber D (2 mks)

_____

_____

3. Use the figure below to answer questions that follow:



a) Identify the division to which the specimen belongs. (1 mk)

_____

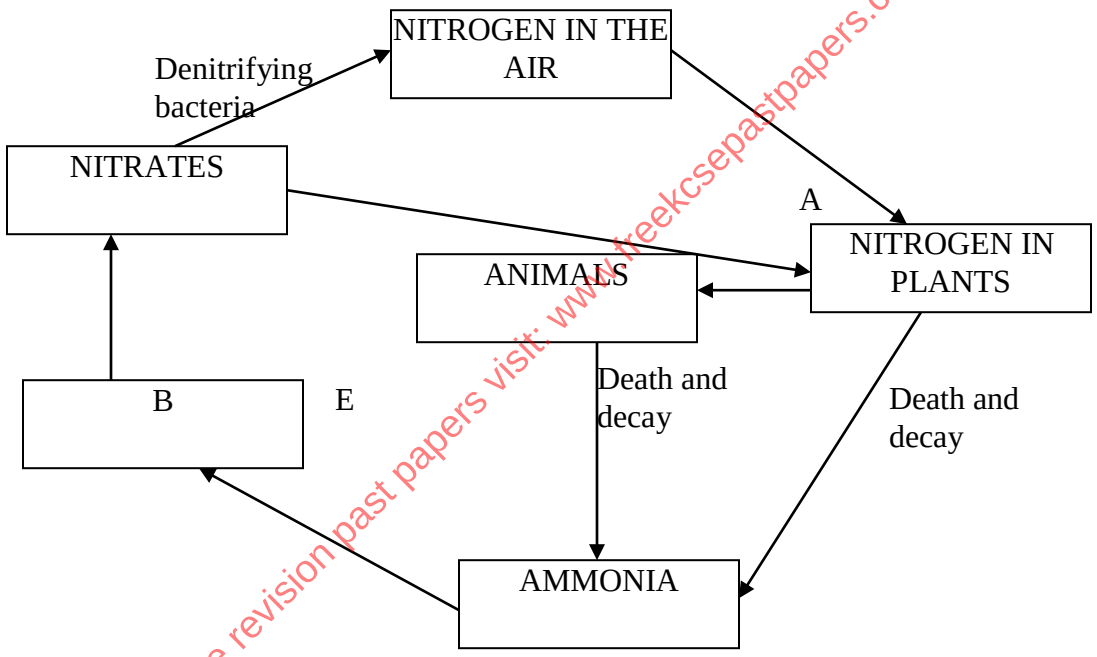
b) Name the parts labeled M, N and P (3 mks)

_____

c) Name the spore producing structures that constitute the part labeled S. (1 mk)

d) Identify three features that distinguish the specimen above from higher plants. (3 mks)

4. The diagram below represents the nitrogen cycle.



i) Name the compound represented by B. (1 mk)

ii) Name the group of organisms represented by E. (1 mk)

iii) State the process labeled A and D. (2 mks)

iv) a) Name the part of the plant where nitrogen fixation takes place. (1 mk)

b) What is the effect of denitrifying bacteria in the soil? (1 mk)

v) How would excess pesticides in the soil interfere with Nitrogen fixation? (2 mks)

_____

_____

5. The diagram below represents two states of blood vessel in human skin under two different environmental conditions.

a. i) Identify process A and B. (2 mks)

_____

_____

ii) What environmental conditions would make the vessel to be in the state (i)? (1 mk)

_____

_____

b. Under certain conditions, carbon (IV) oxide concentration in the blood of mammals rises above normal levels. State two physiological changes that occur to bring carbon (IV) oxide level back to normal. (2 mks)

_____

_____

c. Why does a fresh wound bleed more in hot weather than in cold weather? (1 mk)

_____

d. A certain organ R was surgically removed from a rat. Later a drastic increase in glucose level was observed in the blood. Substance S was injected into the animal's blood. The whole process reversed.
Identify:

i) Organ R _____ (1 mk)

ii) Substance S _____ (1 mk)

SECTION B

QUESTION 6 IS COMPULSORY. ANSWER EITHER QUESTION 7 OR 8

6. In an experiment to determine the effect of ringing on the concentration of sugar in the phloem, a ring of bark from the stem of a tree was cut and removed. The amount of sugar in grammes per $16cm^3$ piece of bark above the ring was measured over a 24-hour period. Sugar was also measured in the bark of a similar stem of tree of same species which was not ringed. The results are shown in the table below.

Time of the day	Amount of sugar in grammes per 16cm3 piece of bark	
	Normal stem	Ringed stem
6.45am	0.78	0.78
9.45am	0.80	0.91
12.45pm	1.81	1.01
3.45pm	1.80	1.04
6.45pm	1.77	1.00
9.45pm	0.73	0.94
12.45am	0.65	0.88

a) Using the same axis, plot graphs of the amount of sugar against time for both stems. (6 mks)

b) At what time was the amount of sugar highest in the:

i) Ringed stem (1 mk)

ii) Normal stem (1 mk)

c) How much sugar would be in the ringed stem if it was measured at 3.45am? (1 mk)

d) Give a reason why there was sugar in the stem of both trees at 6.45am. (2 mks)

_____

_____

e) Account for the shape of the graph for the tree with the ringed stem between:

i) 6.45 and 3.45am (3 mks)

ii) 3.45pm and 12.45am (2 mks)

7. a) What is meant by the term digestion? (2 mks)
   b) Describe how the mammalian small intestine is adapted to its function. (18 mks)

8. Describe the process of fertilization in a flowering plant. (20 mks)