

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

033/2

**BIOLOGY 2
ALTERNATIVE TO PRACTICAL
(For Both School and Private Candidates)**

Time: 2:30 Hours

Friday, 06th November 2015 a.m.

Instructions

1. This paper consists of **five (5)** questions. Answer **all** questions.
2. Each question carries 10 marks.
3. Except for diagrams which must be drawn in pencil, all writings should be in blue or black ink.
4. Calculators and cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

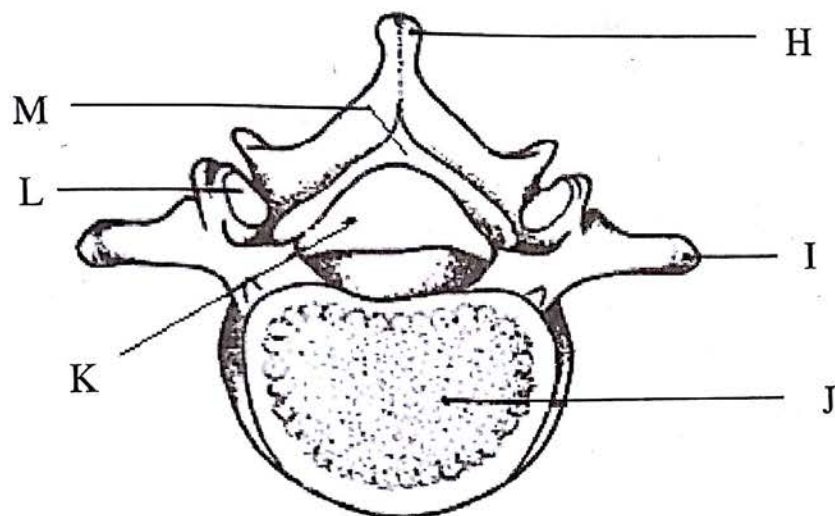
1. In an experiment five sets of three bean seeds each were used. The first set contained dry bean seeds and were placed in glass jar labeled A. The remaining four sets were soaked in water over night and placed separately in each of the four glass jars labeled B, C, D and E. The contents of the five glass jars were varied as shown in the Table 1 below.

Table 1

S/N	Glass Jar	Contents of the Glass Jar
1	A	Dry cotton wool and three bean seeds kept at 25 ⁰ C.
2	B	Three bean seeds, wet cotton wool and a mixture of pyrogalllic acid and NaOH contained in the test tube which is suspended in the jar by a rubber stopper and the jar is stopped and kept at 25 ⁰ C.
3	C	Three bean seeds and wet cotton wool kept at 25 ⁰ C.
4	D	Three bean seeds and wet cotton wool kept at 60 ⁰ C.
5	E	Three bean seeds and wet cotton wool kept at 5 ⁰ C.

- (a) What was the aim of the experiment?
 - (b) State with reason(s) what was observed to the seeds in each glass jar.
2. (a) Draw a diagram of a dissected rat/ mouse to show the alimentary canal and label the parts where each of the following digestive process takes place:
- (i) Grinding of food.
 - (ii) Storage of bile.
 - (iii) Temporary storage of food.
 - (iv) Digestion and absorption of digested food.
 - (v) Absorption of water.
 - (vi) Egestion.
- (b) State four adaptations shown by the structure labeled in (a) (iv) above for absorption of digested food materials.
3. You are provided with a list of four different organisms named termite, coconut plant, peas and tick. Answer the following questions:
- (a) Classify the organisms to class level.
 - (b) State four distinctive characteristic of the class to which peas belongs.
4. The following is a list of six organisms named rat, grasshopper, mango tree, fish, lizard and bird.
- (a)
 - (i) Name the structure(s) used by each organism listed above for gaseous exchange.
 - (ii) State four adaptations shown by the structure used by rat for gaseous exchange.
 - (b) Explain how does each of the following factors affect the rate of respiration in organisms:
 - (i) Age
 - (ii) Health.

5. The following figure represents a typical structure of a mammalian vertebra. Carefully study it and answer the questions that follow:



- (a) (i) Name the parts labeled H, I, J, K, L and M.
(ii) State one function played by each structure labeled J, L and M.
- (b) State three functions of human skeleton.