BIOLOGY REVISON QUESTIONS

1. (a) What is growth?

(b) Why is a change in dry massd of an organisms the best indicator of growth?

(c) What are the limitations of dry mass measurements in assessing growth?

(d) How does growth in animals differ from growth in plants?

2 (a) The diagram below shows the internal structure of a broad bean seed.

1. Name the parts labeled A- D.
2. What is the role of the structure labeled x?

(b) Distinguish between an endospermic seed and anon-endospermic see.

(c) What is the essential difference between epigeal and hypogeal forms of germination in dicotyledonous seeds?

(d) Why is it important that the radical develops first during germination?

1. (a) What is seed dormancy?

(b) List the various causes of seed dormancy. In each case state how such dormancy is broken. (6 marks)

1. (a) List the environmental factors that are necessary for germination and explain the importance of each of them (6 marks)

(b) The viability of seeds is a necessary internal condition for germination. State two factors that may elad to loss of viability.

(c) A farmer packed

(b) List the various causes of seed dormancy. In each case state how such dormancy is broken.

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(b) The viability of seeds is a necessary internal condition for germination. Stte two factors tht may elad to loss of viability.

(c) A farmer packed several sacs of dry maize grains on top of one another in a humid store. He planted the grains during next season and only a few of them germinated. Suggest a reason to explain why most of the grains failed to germinate.

The table below shows the changes observed in the dry weight (in milligrams) of a barley seedling. Its embryo an endosperm during the first 10 days after the onset of germination.

Time (Days) Embryo endosperm whole seedling

0 2 41 45

2 2 39 43

4 7 32 41

6 15 21 38

8 22 11 35

10 35 6 43

1. Suggest how the experiment was carried out.
2. Using a suitable scale and on the same set of axes plot graphs of dry weight of embryo, endosperm and whole seedling against time.
3. Describe and account for the changes in weight shown by (i) embryo (ii)   
   Endosperm (iii) whole seedling during the period of the experiment.
4. Explain how you would expect the weight of the whole seedling to change if the experiment was carried out in the dark.
5. The data below shows the change in average height and dry mass of the stem of an annual leguminous plant. The data was taken between the 1st and the 14th week after planting.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Wk** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** |
| **Height, cm** | **6** | **16** | **31** | **48** | **61** | **71** | **79** | **86** | **91** | **94** | **96** | **96** | **96** | **96** |
| **Mass, g** | **7** | **18** | **37** | **60** | **94** | **145** | **190** | **225** | **250** | **270** | **285** | **305** | **305** | **285** |

1. **Sugges**t how the experiment was carried out.
2. During which two weeks did the largest increase in mass occur?
3. Calculate the average growth rate (in g) during the two weeks you have mentioned in (b above.
4. Between the 11th and the 13th week, average height of the plants remained the same but the mass increased. Suggest an explanation for this observation.
5. Suggest an explanation to account for the decrease in mass after the 13th week.
6. Suggest, giving reasons the change in mass you would expect if the data was taken beyond the 14th week.
7. Why was in necessary to use dry mass instead of fresh mass?
8. Why was it necessary to carry out both dry mass and height measurements?
9. Explain how you can measure the growth of the leaf.
10. A man hammered a nail two metres from the ground surface in the stem of a ten metres tall tree. Two years later, the tree had grown taller an thicker. Explain where you would expect to find the nail.
11. (a) Describe an experiment to show the growth region in the root of a bean seedling.

(b) The diagram below shows he results of an experiment to measure the growth of a bean seedling. Fig. A shows the seedling at the beginning of the experiment when its root was 2 cm long. The root has been marked at 2mm intervals with waterproof ink. Fig B is the same seedling after the root had grown to a length of 3cm but the marks are not shown.

1. Copy Fig. B and on it mark th approximate positions of the ink marks.
2. Explain the location of the marks you have mad on Fig. B.
3. Name the type of germination shown by the seed in the diagram.

(Iv) The cells shown below were obtained form different parts of a young root tip.

Give the name of the zone from which each cell was obtained..

1. (a) Define the term metamorphosis

With reference to insects, explain the terms incomplete and complete metamorphosis. Give examples I each case.

(b) Distinguish between heartwood and sapwood.