

Write your Examination Number here

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AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1985

BIOLOGY—ORDINARY LEVEL

TUESDAY, 18 JUNE—MORNING, 9.30 to 12.30

No. 32899

Answer six questions from Part I and four questions from Part II.

You should not spend more than 45 minutes on Part I, leaving about 135 minutes for Part II.

PART I (120 marks)

Answer six questions. Each question carries 20 marks.

Write your answers in the spaces provided.

Keep your answers short.

Write your examination number at top.

Be sure to return this part of the examination paper; enclose it in the answer-book you use for answering Part II.

I. Answer four of the following by placing the correct answer (a), (b), (c), or (d) in the space provided.

(i) The main functions of the human kidney are

- (a) osmoregulation and egestion
- (b) excretion and urea manufacture
- (c) osmoregulation and excretion
- (d) excretion and egestion

Answer

(ii) Which of the following is *not* a plant hormone?

- (a) auxin
- (b) insulin
- (c) gibberellin
- (d) abscisic acid

Answer

(iii) The wood of a tree is formed from the

- (a) collenchyma
- (b) phloem
- (c) bark
- (d) xylem

Answer

(iv) The sensory cells in the ear which detect sound are situated in the

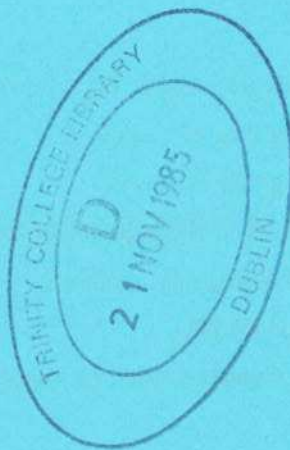
- (a) cochlea
- (b) pinna
- (c) eardrum
- (d) semi-circular canals

Answer

(v) In an insect which shows complete metamorphosis, which of the following sequences is correct?

- (a) egg → larva → pupa → nymph
- (b) egg → nymph → pupa → adult
- (c) egg → adult → pupa → larva
- (d) egg → larva → pupa → adult

Answer



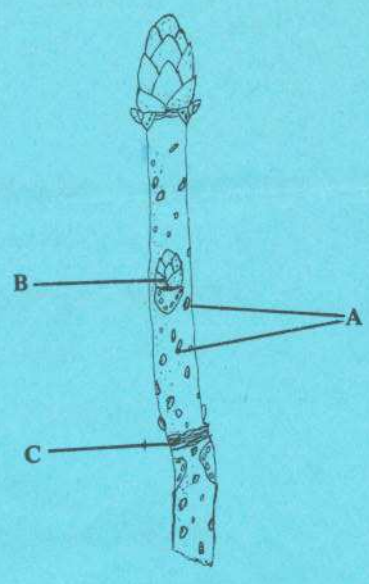
2. (a) The diagram shows a twig in winter. Name the parts labelled A, B, C.

- A
- B
- C

Which of the labelled parts can you use to tell the age of the twig?

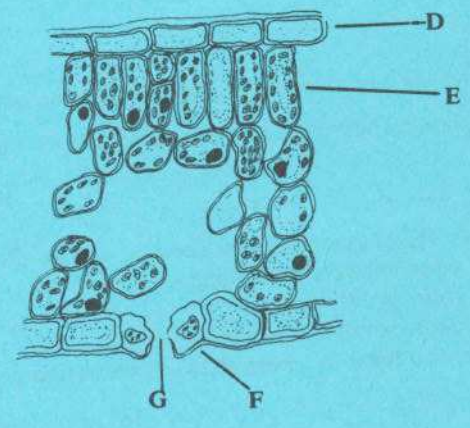
How many years growth does this twig show?
1 year, 4 years, 2 years, none of these

Answer



(b) The diagram shows a T.S. of a leaf. Name the cells labelled D, E, F.

- D
- E
- F



State the function common to the part labelled A in the twig and G in the leaf.

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3. In the spaces provided indicate whether the following statements are true or false.

- (a) Scurvy is caused by a lack of vitamin C. (a)
- (b) A bulb is a modified group of leaves. (b)
- (c) Glucose turns blue-black in the presence of iodine solution. (c)
- (d) A pathogen is a disease-causing organism. (d)
- (e) Sebaceous glands produce bile. (e)
- (f) Antibiotics can cure diseases caused by viruses. (f)
- (g) Spiders are insects. (g)
- (h) The cotyledons of a seed act as a food supply. (h)
- (i) Hydrotropism is *not* the response of plants to light. (i)
- (j) *Spirogyra* reproduces by budding. (j)

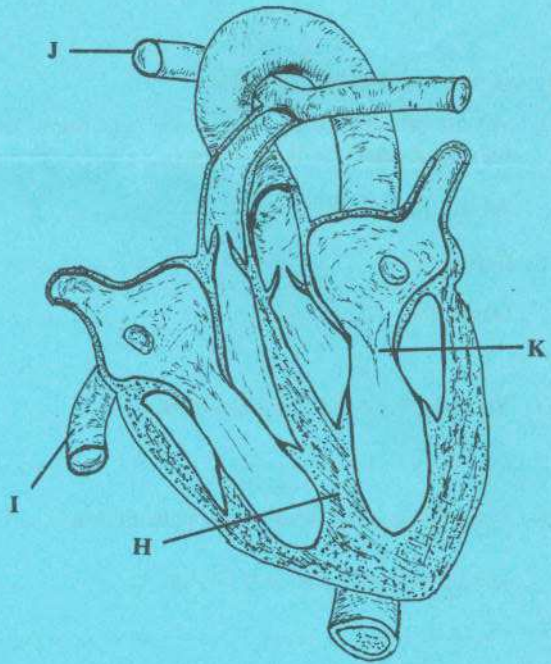
4. (i) Name the parts labelled H, I, J, K on the diagram of the dissected heart and its blood supply.

H

I

J

K



(ii) Mark on the diagram, with the letter X, the position of the pacemaker.

(iii) State the function of the pacemaker.

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(iv) Why is the wall of the left ventricle thicker than the wall of the right ventricle?

.....

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(v) Name two factors that speed up the rate of the heart beat.

1 2

5. Name one element, other than carbon, hydrogen and oxygen, which is particularly required in each of the following cases.

making haemoglobin

making protein

making bone

making thyroxine

making ATP

It is often recommended that the water in which vegetables are boiled should be consumed rather than thrown away.

Suggest a reason for this advice.

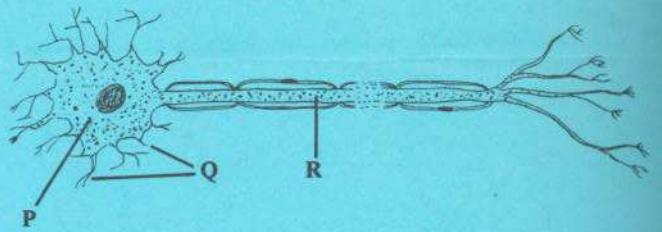
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6. The diagram represents a neuron.

(i) Which of the labels P, Q, R, represent the following parts of the neuron?

- Axon
- Cell body
- Dendrites



(ii) State the function of the dendrites

(iii) Is the neuron shown a motor neuron or a sensory neuron?

Give one reason for your choice.

(iv) What is a synapse?

7. For each of the following, distinguish between the members of the pairs of terms by writing a brief explanatory note on each term.

(i) chlorophyll and chloroplast

(ii) ligament and tendon

(iii) genotype and phenotype

(iv) herbivore and carnivore

(v) potometer and clinostat

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Part I is on a separate sheet which provides spaces for your answers. The completed sheet should be enclosed in your answer-book.

PART II (280 marks)

Write your answers to this part in your answer-book.

Answer **four** questions. Each question carries 70 marks.

8. (a) Name the parts labelled A – G in the diagram of the human alimentary canal and its associated glands.

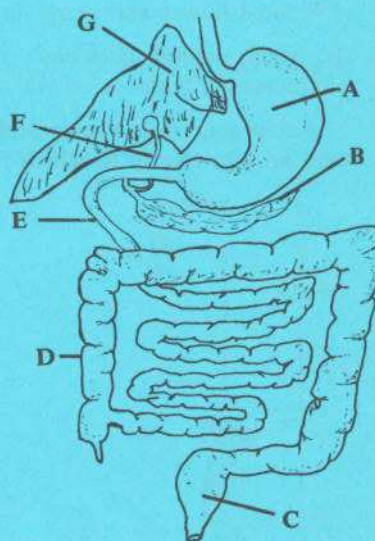
State which of the labelled parts

- (i) is an acidic region;
- (ii) produces bile;
- (iii) produces lipase.

- (b) Lipase is an enzyme.

- (i) Explain the underlined term.
- (ii) Give the end-products of the action of lipase in the digestive system.
- (iii) Give one example of the action of an enzyme other than in digestion.

Describe an experiment to show the action of an enzyme.



9. (a) Outline *three* ways in which fungi are important economically and *three* ways in which they are important medically.

Draw a large labelled diagram to show the structure of *Rhizopus*. Outline how you would grow a pure sample of *Rhizopus* in the laboratory. How does *Rhizopus* obtain its food?

- (b) Show by means of a diagram the main features of the nitrogen cycle.

10. (a) Explain the term incomplete dominance.

In snapdragons the flower colour can be red (R), white (r) or, in the heterozygous condition, pink. In addition, tall (T) is dominant over dwarf (t).

A dwarf red snapdragon plant is crossed with a homozygous tall white snapdragon plant.

Show (i) the genotypes of the two parents;

(ii) the genotypes of the gametes;

(iii) the possible genotypes and phenotypes of the offspring.

- (b) Outline the process of mitosis with the aid of diagrams to show the stages prophase, metaphase, anaphase, and telophase.

11. (i) Explain the terms: competition and succession as used in ecology.

Describe, with the aid of diagrams where appropriate, any *three* of the following and explain how you would use each of the three in a study of an ecosystem: (i) transect (state the type), (ii) quadrat, (iii) pitfall trap, (iv) pooter, (v) capture-recapture technique, (vi) beating tray.

- (ii) Physical and chemical factors can affect the distribution of organisms in an ecosystem. Give one example of each type of factor. State how one of the factors you give affected the distribution of a named organism in the ecosystem you have studied.

Give one example to illustrate how a knowledge of such factors could be of use to a farmer or fisherman.

12. Give the equation (words or symbols) to represent the process of photosynthesis. Give one use in plants for each of the products of photosynthesis.

In an experiment a pot plant is treated as follows:

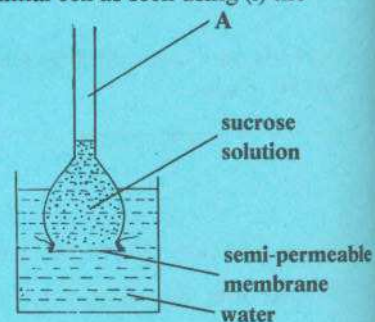
- The plant is placed in a dark cupboard for 48 hours.
- Strips of aluminium foil are placed across part of two of the leaves as shown in the diagram.
- The plant is exposed to bright light for several hours.
- The leaves with the aluminium foil are plunged into boiling water for a few seconds.
- These leaves are then placed in warm alcohol.
- These leaves are then transferred to warm water.
- Finally these leaves are covered with iodine solution.



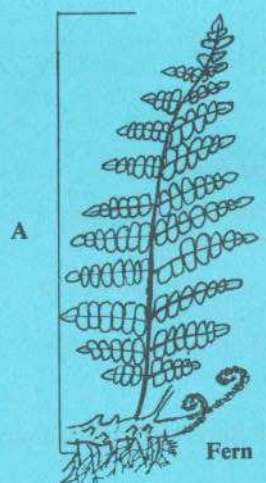
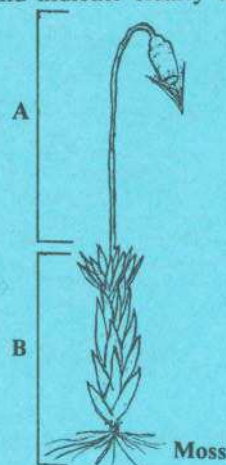
Briefly explain the purpose of each of the above practical procedures carried out in this experiment. Give the result you would expect for the leaves tested with iodine solution (use a labelled diagram or words).

13. (a) Draw labelled diagrams (one in each case) to show the structure of a typical animal cell as seen using (i) the light microscope, (ii) the electron microscope. State briefly the function of any six of the parts you label.

- (b) The diagram shows a simple experiment. Name the process being studied. Explain the term semi-permeable membrane. State what you would expect to observe in tube A after a period of time giving a reason for your answer.



14. (a) Explain the terms pollination, fertilisation. List *three* differences between a wind-pollinated and an insect-pollinated flower and name an example of each type of flower.
- (b) To which phylum does each of the following belong: salmon, snail, earthworm. In each case give *two* characteristic features on which you base your classification.
- (c) The diagrams show a moss and a fern. Answer the following with regard to *one only* of the plants shown and indicate clearly to which plant you refer.



[Diagrams not to scale]

Which of the labelled parts, A or B,

- (i) is the sporophyte generation; (ii) produces gametes; (iii) is haploid; (iv) is produced from spores?

15. Answer *two* of the following.

- (a) Distinguish between aerobic and anaerobic respiration. Give the end-products of (i) anaerobic respiration in yeast, (ii) aerobic respiration in humans. Describe an experiment to show that respiring organisms release heat.

- (b) In an experiment on a soil sample the following results were obtained.

mass of dish	40g
mass of dish + fresh soil	200g
mass of dish + soil after 3 days in an oven at 100°C	112g
mass of dish + soil after being heated strongly over a Bunsen burner for	
(i) 10 minutes	88g
(ii) 20 minutes	80g
(iii) 30 minutes	80g

From these results calculate

- the percentage (%) water in the original fresh soil sample;
- the percentage humus in the original fresh soil sample.

Why was heating over the Bunsen burner continued until two readings were of the same value? Give *three* reasons why humus is an important part of the soil.

- (c) Write explanatory notes on *four* of the following with reference to human reproduction: ovulation, semen, implantation, ejaculation, menstruation, lactation.

- (d) Draw a large diagram of the human eye and label eight parts. Describe an experiment to demonstrate the blind spot.