

WARNING: You must return this section with your answer book otherwise marks will be lost.

Write Your
Examination
Number here

AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1996

18762

BIOLOGY — ORDINARY LEVEL

WEDNESDAY, 12 JUNE — AFTERNOON 2.00 to 5.00

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.

1. Answer *four* of the following:

- (a) The cell structure associated with photosynthesis is the
- (b) The method of reproduction by *Amoeba* is known as
- (c) Antibiotics can destroy or inhibit the growth of.....
- (d) The organ mainly responsible for the production of urea in the mammal is the.....
- (e) An example of an animal which possesses a coelom is

2. A sample of fresh soil was taken to the laboratory where it was found to weigh 100 grams. After placing in an oven at 100°C for 30 minutes the sample was weighed and replaced in the oven for another period until no further change in weight was observed. It was found to weigh 85 grams after this treatment.

- (i) Name the soil component which was removed by the treatment described above.
.....
- (ii) What percentage of the fresh soil was lost due to this treatment?
.....
- (iii) Name the soil component which is removed by burning the treated soil to ash.
.....
- (iv) Name any other soil component apart from those mentioned in the answers to (i) and (iii) above.
.....

3. The diagram shows some of the apparatus used in an experiment to test a green leaf for the presence of starch.

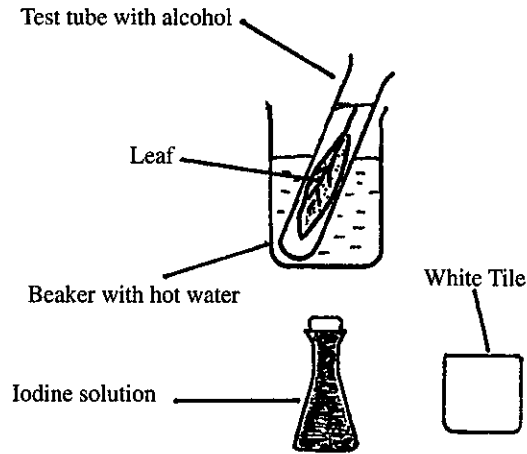
At the start of the experiment the leaf is boiled for a few minutes. Why?

.....

Why is the leaf placed in a test tube containing alcohol?

.....

.....



The leaf is later taken from the test tube and placed on a white tile and is covered with iodine solution. When should the leaf be removed from the test tube?

.....

If the leaf contains starch what happens when it is covered with the iodine solution?

.....

If a variegated leaf were used in the above experiment what effect would the iodine have on the white areas of the leaf?

.....

4. The diagram shows a typical mammalian eye.

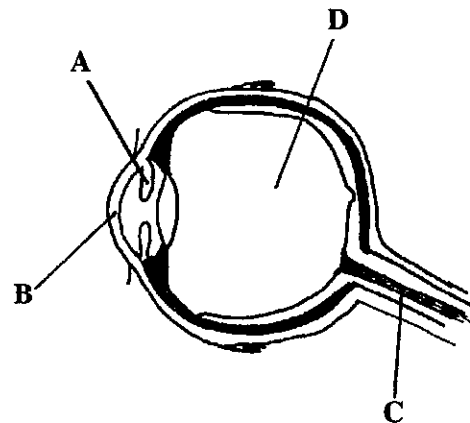
Name the parts labelled A, B, C, D.

A.

B.

C.

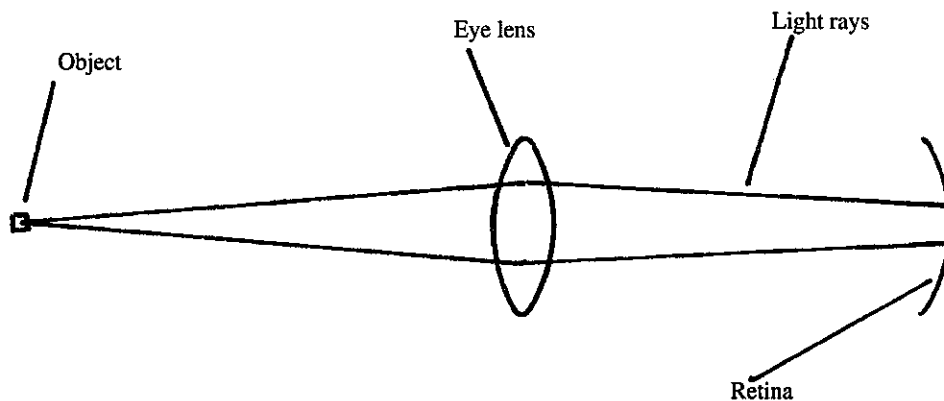
D.



State the function of the part labelled A

.....

Complete the diagram below by inserting the appropriate type lens in front of the eye lens to correct the defect shown and show the effect this lens has on the rays of light as they touch the retina.



5. A hormone is described as a chemical which is produced in a ductless gland and carried in the blood and lymph to a target organ where it performs a specific function.

Explain the term ductless gland.
.....
.....

Ductless glands are also called endocrine glands.

Name an endocrine gland.....

Name a hormone produced in this gland.

Name the target organ this hormone affects.....

State the function of this hormone

6. Name the bone labelled X on the diagram of the arm.

.....

The muscles on either side of bone X are labelled Y and Z. Name both.

Y.....

Z.....

The letter W indicates the tissue which attaches muscles to bone. Name the tissue W.

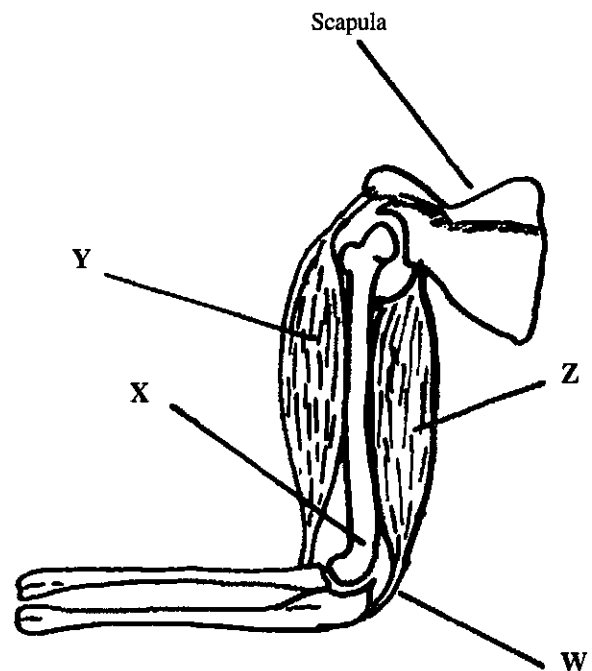
.....

Name the type of joint between bone X and the shoulder blade (scapula).

.....

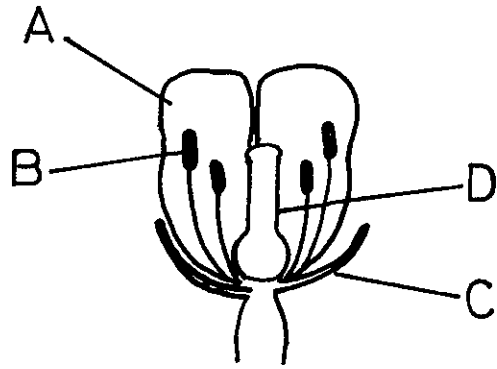
Give another example of this type of joint in the human body.

.....



7. The diagram shows a section through a typical flower. Name the parts labelled A, B, C, D.

- A.
- B.
- C.
- D.



Flowers which are pollinated by insects have a number of adaptations by which they attract the insects. List two of these adaptations.

- (i)
- (ii)

Wind pollinated flowers have other adaptations. Name one such wind adaptation.

.....

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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) A packed school lunch contains cheese and ham sandwiches made with brown bread and butter, a yogurt and a $\frac{1}{4}$ litre carton of orange juice.

Which of the above foods would be a good source of

- (i) carbohydrate?
- (ii) fat?
- (iii) protein?
- (iv) fibre?

Name one vitamin and one mineral found in this lunch and state which of the above foods contains the vitamin and the mineral that you name.

Which of the above foods supplies materials used by your body,

- (i) to repair a cut or injury
- (ii) to provide energy to run a 100 meter sprint? (30)

- (b) Draw and label a diagram of a tooth.

Name the four different types of tooth in the human mouth.

Name an enzyme found in the stomach which digests protein. What is the product of protein digestion in the stomach?

In testing for protein we can use either the Biuret test or Millons test. State the result you would get using either of these tests on egg white or egg albumen. (40)

9. (a) Name a habitat in which you have carried out a practical ecological study. From your study of that habitat;
- (i) construct a food chain involving a producer, a herbivore and a carnivore.
 - (ii) describe how any two organisms are adapted to that habitat.
 - (iii) give an example of competition between animals.
 - (iv) give an example of a physical or chemical factor and show how that factor affected the distribution of a named organism.
 - (v) describe in detail two pieces of apparatus you used and explain how each was used. (51)
- (b) Suggest a reason for each of the following recommended practices;
- (i) spreading slurry on land during dry weather only.
 - (ii) applying a minimum size to the net mesh used by fishing trawlers.
 - (iii) establishing special seasons for the hunting of game (birds and mammals). (19)

10. (a) Name the phylum to which insects belong and state two of its characteristics.

Name the four stages in the complete metamorphosis of an insect (e.g. butterfly, housefly etc.).
Explain the term ecdysis (moulting) and why it occurs.

State three ways in which insects are important to man either medically or economically. (43)

- (b) State two characteristics of each of the following

(i) Chordates;

(ii) Fungi;

(iii) Molluscs.

Man is a mammal. So also are rodents, cattle, horses, sheep, etc. What characteristics do we share with these animals which enable us to be classed with them as mammals? (27)

11. (a) Draw a large labelled diagram of a flowering plant to show the following features:

root, stem, leaf, flower, node, lateral bud.

From which of these parts will the seed develop?

What is meant by dispersal of seeds? Give one reason that dispersal is so important and name two common methods of seed dispersal. (31)

- (b) What is meant by germination of seeds? State two conditions necessary for it to take place.

Explain the term hypogeal germination.

Outline, by means of labelled diagrams, three stages in the complete hypogeal germination of a named seed. (39)

12. The fruit fly *Drosophila* is used to increase our knowledge of genetics. The somatic (body) cells of *Drosophila* are diploid and contain four pairs of chromosomes. Body colour is determined by two alleles; the allele for grey body (G) is dominant to the allele for black body (g).

(i) How many chromosomes are there in a *Drosophila* gamete?

(ii) What would you expect to be the sex of a fruit fly carrying the chromosomes XX?

(iii) Males and females have specific names for the organ used to produce the gametes. What are those names?

(iv) What kind of cell division results in the formation of haploid cells from a diploid cell?

(v) What is the phenotype of a fruit fly heterozygous for body colour?

(vi) State the two possible genotypes of the gametes produced by the fly described in (v).

(vii) State the genotype of a black-bodied fly.

(viii) State the two possible genotypes of a grey-bodied fly.

(ix) If two fruit flies, heterozygous for body colour, were crossed, state clearly the ratio of grey-bodied to black-bodied flies among their offspring.

13. (a) Explain the terms transpiration and diffusion.
Describe, with the aid of a labelled diagram, an experiment by which you would demonstrate the process of osmosis. (33)
- (b) Respiration is described as the controlled release of energy in the living cell. It can occur aerobically or anaerobically. Explain both of the underlined terms.
During breathing (inhaling and exhaling) we use the diaphragm, the intercostal muscles and the brain. Describe briefly the breathing mechanism with reference to the three underlined words.
By comparison, explain briefly how the exchange of gases is controlled in plants. (37)
14. (a) A piece of bread was left in the open in a damp place. After a few days a mould (*Rhizopus*) was seen growing on the bread.
- (i) To what group of organisms does *Rhizopus* belong?
- (ii) Draw and label a diagram of *Rhizopus*.
- (iii) Describe how *Rhizopus* reproduces asexually.
- (iv) How did the mould arrive on the bread?
- (v) Outline how *Rhizopus* obtains its nutrition. (46)
- (b) Describe an experiment to show that micro-organisms are present in the air. (24)
15. Answer *two* of the following: (35, 35)
- (a) Draw a transverse section of a young dicotyledenous stem and indicate clearly the positions of the following: xylem, phloem, cambium, pith, cortex, epidermis.
Which of the structures you have labelled is involved in transport of water?
Describe a simple experiment to show that water is transported from the roots upwards through the stem.
The root tip is described as being a meristem. Explain this underlined term and give another example of a meristem in a plant.
- (b) Write notes relating to the functions of *five* of the following:
- (i) seminal vesicle.
- (ii) urethra.
- (iii) uterus.
- (iv) placenta.
- (v) mammary gland.
- (vi) Fallopian tube.
- (vii) amnion.
- (c) Draw a large diagram of a transverse section through the skin and label the following parts: dermis, hair, epidermis, sweat gland, oil (sebaceous) gland, fat.
Describe three functions of the skin.
- (d) *Spirogyra*, which has a cylindrically shaped cell, is usually found as a filament (chain) of cells. Draw a diagram of a single *Spirogyra* cell and label the following: mucilage layer, cell wall, cytoplasm, vacuole, nucleus, chloroplast.
Spirogyra reproduces sexually only in adverse conditions. Outline briefly the process of sexual reproduction in *Spirogyra* which is known as conjugation.