



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

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**CO-ORDINATED SCIENCES**

**0654/12**

Paper 1 Multiple Choice

**October/November 2011**

**45 minutes**

Additional Materials: Multiple Choice Answer Sheet  
Soft clean eraser  
Soft pencil (type B or HB is recommended)

\* 8 8 3 9 7 8 5 4 0 8 \*

**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.  
Do not use staples, paper clips, highlighters, glue or correction fluid.  
Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

**Read the instructions on the Answer Sheet very carefully.**

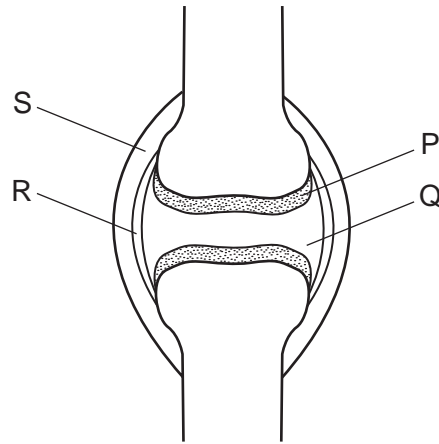
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.  
Any rough working should be done in this booklet.  
A copy of the Periodic Table is printed on page **16**.

This document consists of **16** printed pages.



2

1 The diagram shows a synovial joint.



Which two parts prevent friction between the bones?

- A** P and Q      **B** P and R      **C** Q and R      **D** Q and S

2 The binomial name for a tiger is *Panthera tigris* and for a lion, *Panthera leo*.

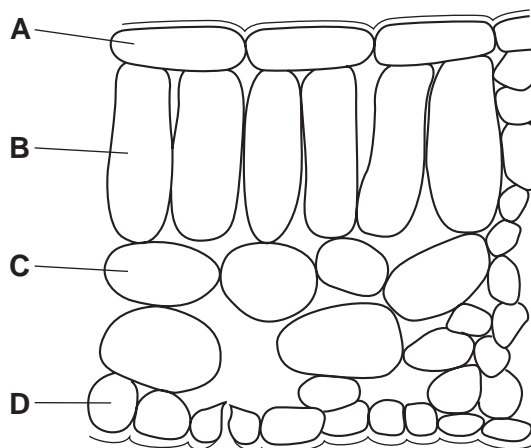
What do the scientific names show?

Lions and tigers

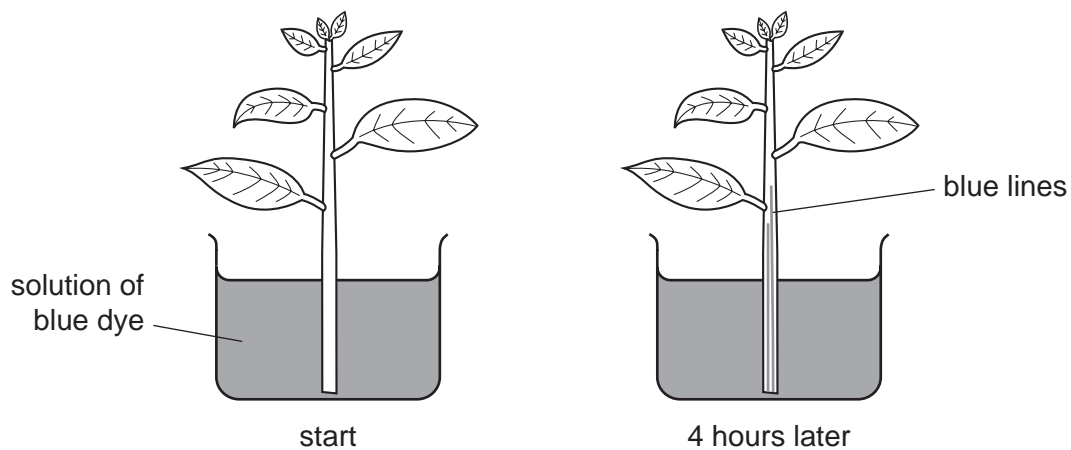
- A** are both in the same species.  
**B** are genetically identical.  
**C** can interbreed.  
**D** have many features in common.

3 The diagram shows a section through a leaf.

Which layer of cells produces most sugar?



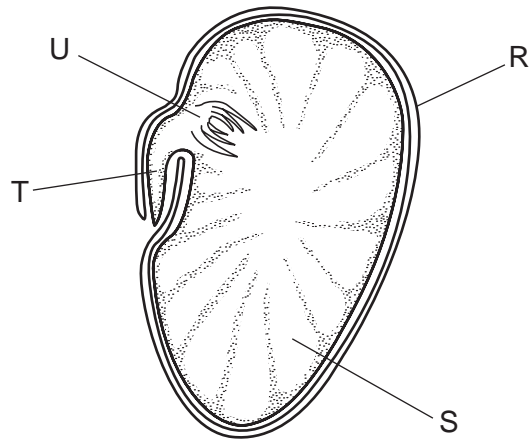
- 4 A swollen abdomen caused by kwashiorkor is a symptom of a lack of which dietary component?
- A carbohydrate
  - B fat
  - C fibre
  - D protein
- 5 Why is a leaf first dipped into hot water when performing the starch test?
- A to make its membranes permeable
  - B to make starch soluble
  - C to remove air from intercellular spaces
  - D to remove chlorophyll
- 6 The diagram shows a shoot of a plant with a transparent stem in a solution of blue dye.



What do the blue lines in the stem show?

- A The dye is drawn up the phloem in the stem.
- B The dye moves up the stem by diffusion.
- C The dye shows liquid can circulate in the stem.
- D The dye travels through tubes in the stem.

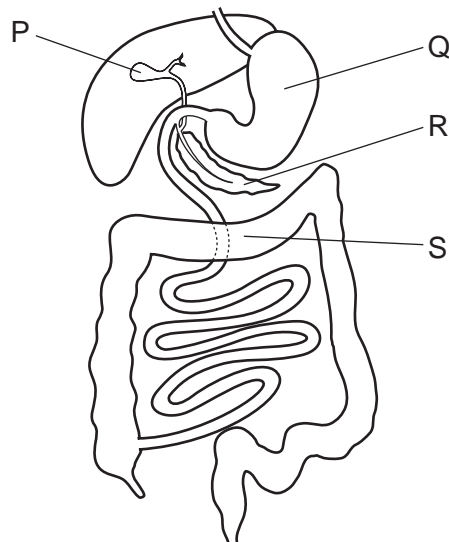
- 7 The diagram shows a section through a bean seed.



What are the labelled parts?

|          | cotyledon | plumule | radicle | testa |
|----------|-----------|---------|---------|-------|
| <b>A</b> | R         | T       | U       | S     |
| <b>B</b> | R         | U       | T       | S     |
| <b>C</b> | S         | T       | U       | R     |
| <b>D</b> | S         | U       | T       | R     |

- 8 The diagram shows some parts of the alimentary canal and its associated organs.



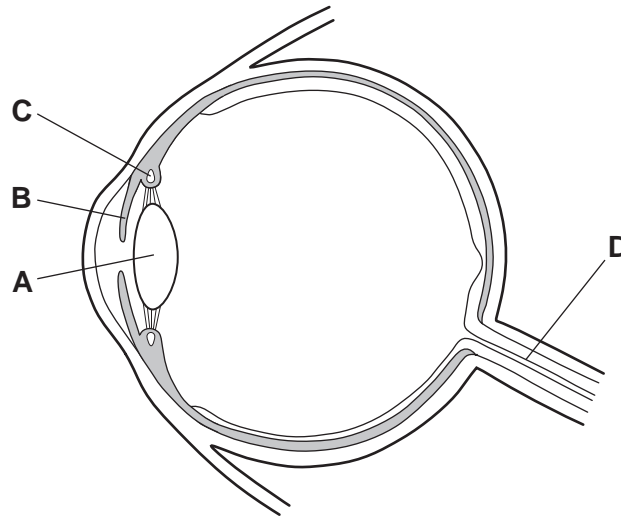
Which organs produce digestive enzymes?

- A** P and Q      **B** Q and R      **C** R and S      **D** S and P

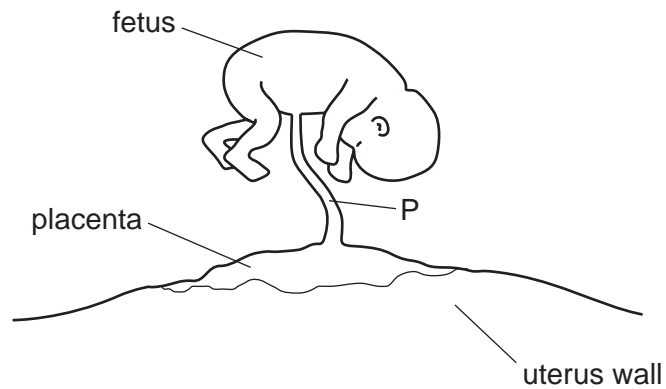
- 9 The diagram shows a section through the eye.

When a person moves from shade into bright sunlight, a reflex action takes place.

Where does the response to bright sunlight occur?



- 10 The diagram shows a fetus attached to its mother's uterus via the placenta.



What is carried in structure P?

|          | mother's blood | fetus's blood | oxygenated blood | deoxygenated blood |
|----------|----------------|---------------|------------------|--------------------|
| <b>A</b> | ✓              | x             | ✓                | x                  |
| <b>B</b> | ✓              | x             | x                | ✓                  |
| <b>C</b> | x              | ✓             | ✓                | ✓                  |
| <b>D</b> | x              | ✓             | x                | ✓                  |

key

✓ = carried in P

x = not carried in P



15 Which would be a liquid at 50 °C?

|          | melting point °C | boiling point °C |
|----------|------------------|------------------|
| <b>A</b> | -100             | 80               |
| <b>B</b> | -73              | -10              |
| <b>C</b> | -60              | 40               |
| <b>D</b> | 95               | 280              |

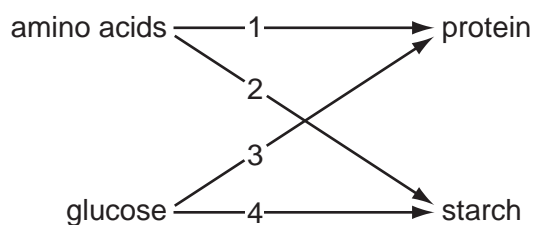
16 Processes used in the petrochemical industry include

- 1 cracking,
- 2 distillation.

For which of these processes is a catalyst used?

- A** both 1 and 2  
**B** 1 only  
**C** 2 only  
**D** neither 1 nor 2

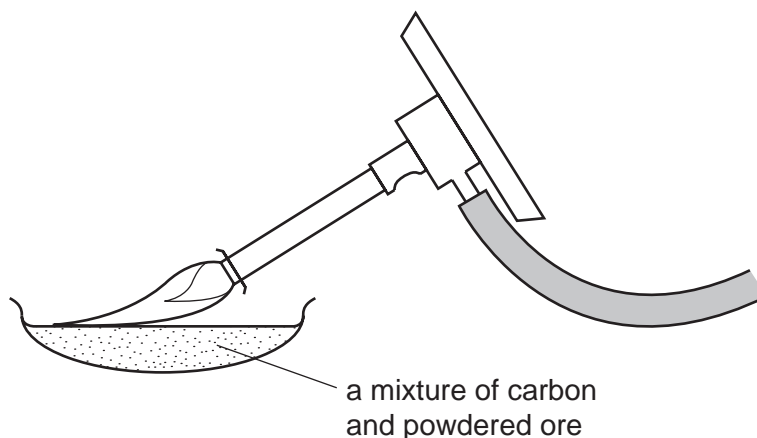
17 In the diagram below, the compounds on the left are monomers and those on the right are polymers.



Which two arrows link the monomer to the correct polymer?

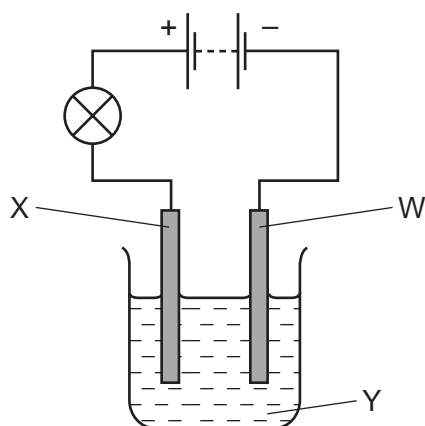
- A** 1 and 2      **B** 1 and 4      **C** 2 and 3      **D** 3 and 4

- 18 The diagram shows a metal being extracted from its powdered ore using carbon.



What happens to the ore in this reaction?

- A It burns.
  - B It decomposes.
  - C It is oxidised.
  - D It is reduced.
- 19 An experiment is set up to test the effect of electricity on solution Y.

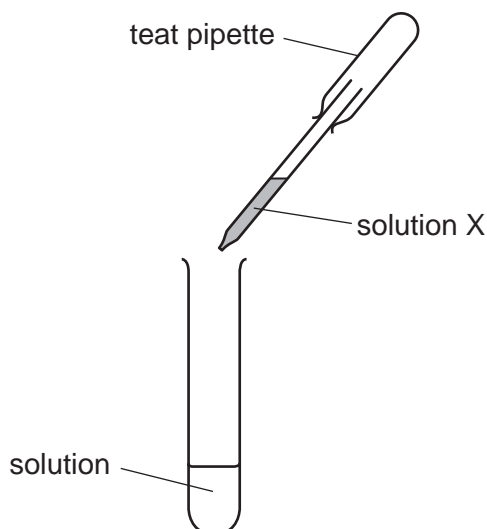


What are the names of W, X and Y?

|   | W       | X       | Y           |
|---|---------|---------|-------------|
| A | anode   | cathode | electrode   |
| B | anode   | cathode | electrolyte |
| C | cathode | anode   | electrode   |
| D | cathode | anode   | electrolyte |



20 Using solution X, a student successfully tested for the presence of chloride ions.



What is solution X and the result of the test?

|          | solution X              | result             |
|----------|-------------------------|--------------------|
| <b>A</b> | dilute sulfuric acid    | yellow precipitate |
| <b>B</b> | dilute sulfuric acid    | white precipitate  |
| <b>C</b> | silver nitrate solution | yellow precipitate |
| <b>D</b> | silver nitrate solution | white precipitate  |

21 Diamond and silicon(IV) oxide are hard materials.

What could be the reason for this?

- A** They are compounds of non-metallic elements.
- B** They are naturally occurring materials.
- C** They have giant structures with covalent bonding.
- D** They have very high melting points.

22 Why is an analgesic used in medicine?

- A** as a painkiller
- B** as a vitamin
- C** to kill bacteria
- D** to kill viruses



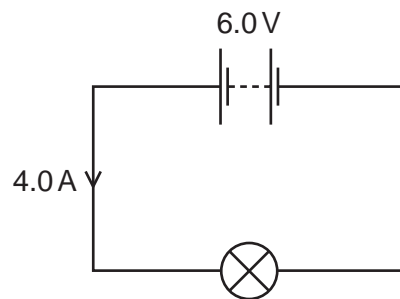
27 Which is a solid fossil fuel?

- A coal
- B oil
- C sugar
- D wood

28 Which of the following is a unit of density?

- A  $\text{cm}^3/\text{g}$
- B  $\text{g}/\text{cm}^2$
- C  $\text{g}/\text{cm}^3$
- D  $\text{kg}/\text{m}^2$

29 The circuit shows a lamp connected to a 6.0V battery.

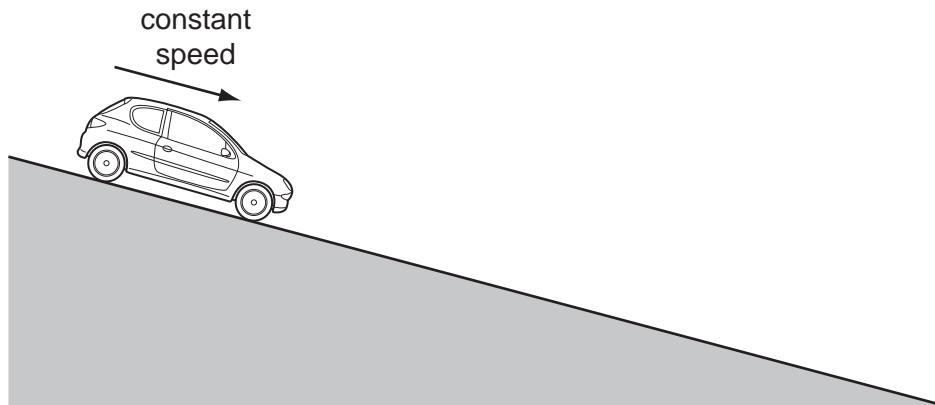


A current of 4.0A flows in the circuit for 20s.

How much charge flows through the lamp?

- A 120C
- B 80C
- C 24C
- D 0.20C

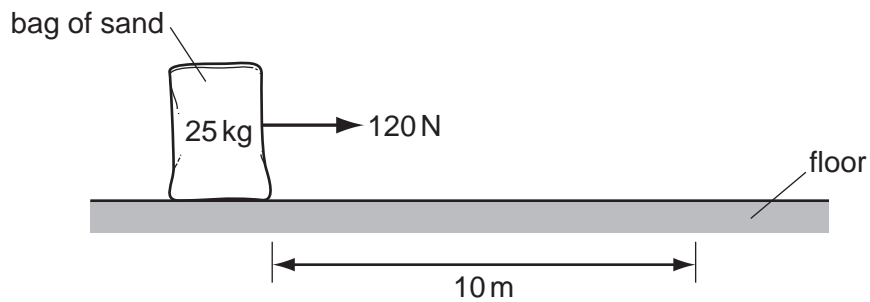
- 30 A car rolls down a hill at a constant speed.



Which row describes the friction force and the unbalanced force acting on the car?

|          | friction force | unbalanced force |
|----------|----------------|------------------|
| <b>A</b> | acts downhill  | acts downhill    |
| <b>B</b> | acts uphill    | acts downhill    |
| <b>C</b> | acts uphill    | is zero          |
| <b>D</b> | is zero        | is zero          |

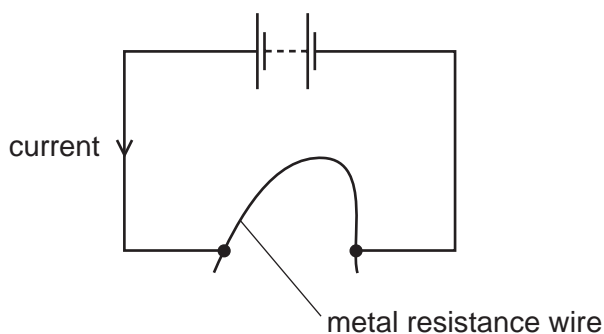
- 31 A horizontal force of 120 N is used to pull a 25 kg bag of sand 10 m along a floor.



How much work is done by the force?

- A** 2.5 J      **B** 12 J      **C** 250 J      **D** 1200 J
- 32 A girl of mass 50 kg is running at 6.0 m/s.
- What is her momentum?
- A** 300 J      **B** 300 kg m/s      **C** 900 J      **D** 900 kg m/s

- 33 A student connects a length of metal resistance wire to a battery.



The student wishes to increase the current in the resistance wire.

Which change would do this?

- A Connect a second wire in series with the first wire.
  - B Heat the wire.
  - C Shorten the wire.
  - D Use a thinner wire.
- 34 Which type of electromagnetic waves are used for cooking?
- A gamma rays
  - B infra-red waves
  - C ultraviolet waves
  - D X-rays
- 35 A sky-diver jumps from a helicopter which is very high and not moving.

She does not open her parachute when she first jumps.

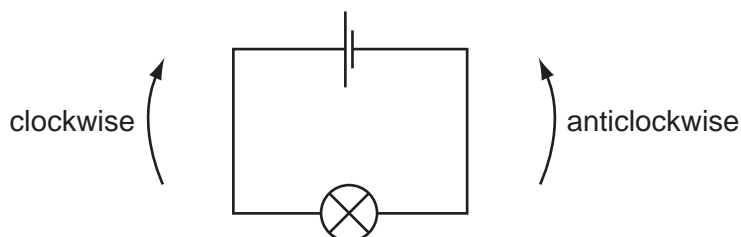
Which row describes her acceleration and the air resistance acting on her in the first few seconds as she falls?

|          | acceleration | air resistance |
|----------|--------------|----------------|
| <b>A</b> | constant     | constant       |
| <b>B</b> | constant     | increasing     |
| <b>C</b> | decreasing   | constant       |
| <b>D</b> | decreasing   | increasing     |

36 What are the particles given off by the heated tungsten filament in a thermionic diode?

- A alpha particles
- B electrons
- C neutrons
- D protons

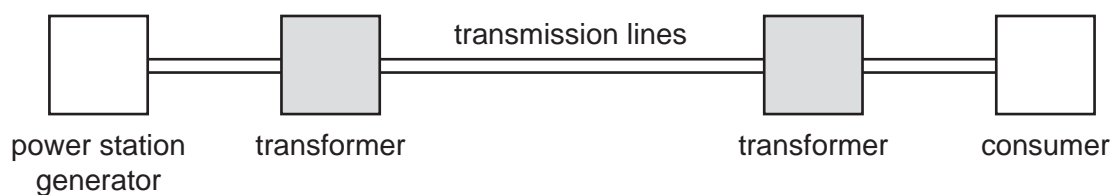
37 Charged particles flow in the circuit below.



What are the particles and which way do they flow?

|          | particles | direction     |
|----------|-----------|---------------|
| <b>A</b> | electrons | clockwise     |
| <b>B</b> | electrons | anticlockwise |
| <b>C</b> | protons   | clockwise     |
| <b>D</b> | protons   | anticlockwise |

38 The diagram represents an electrical energy transmission system.



Why are the transformers used?

- A to decrease the energy loss from the transmission lines
- B to make the transmission lines safer
- C to supply the consumer with energy at very high voltage
- D to transmit the energy from the power station at low voltage

39 A light bulb is marked '3.0V, 6.0W'.

How much current flows in the bulb when it operates at normal brightness?

- A 0.50A
- B 2.0A
- C 6.0A
- D 18A

40 A machine is claimed to be 100% efficient.

For this to be true, which statement must be correct?

- A All the energy put into it is changed into useful energy.
- B It is very easy to use.
- C It produces more energy than is put into it.
- D It wastes a small amount of energy.

