

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE (PHYSICS, BIOLOGY)

5125/01

Paper 1 Multiple Choice

October/November 2004

1 hour

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

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.

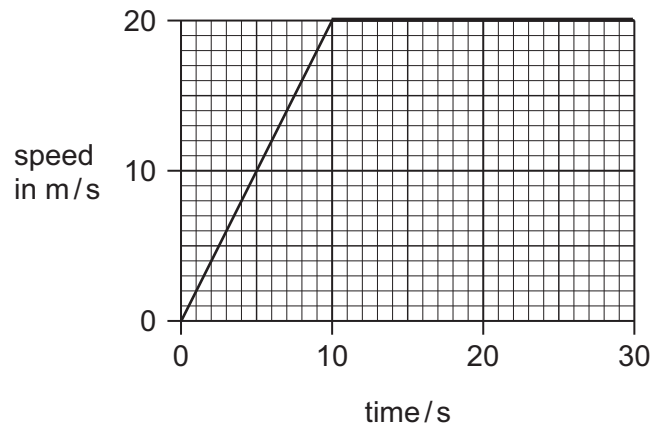
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

This document consists of **15** printed pages and **1** blank page.



- 1 The graph shows part of a car journey.



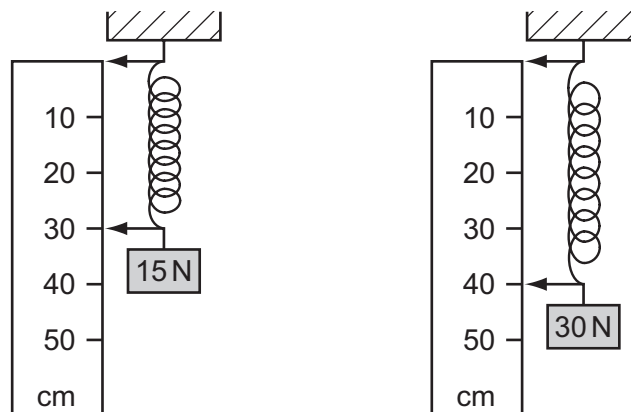
What distance is travelled by the car in the first 20 s?

- A** 100 m **B** 200 m **C** 300 m **D** 400 m
- 2 The table shows the weights of some masses on the surface of four different planets.

Which planet has the greatest gravitational field strength?

	mass	weight
A	0.5 kg	20 N
B	2.0 kg	20 N
C	0.5 kg	40 N
D	2.0 kg	40 N

- 3 The diagrams show the same spring with different weights attached.



When the weights are removed, the spring returns to its original length.

What is the original length of the spring?

- A** 25 cm **B** 20 cm **C** 15 cm **D** 10 cm

4 Brakes are used to stop a car.

What is most of the kinetic energy converted into?

- A heat energy
- B light energy
- C potential energy
- D sound energy

5 In a hydroelectric power station, water flows from a high reservoir to turn turbines to generate electricity.

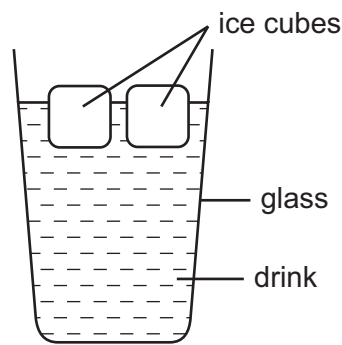
Which energy conversions take place?

- A gravitational potential → chemical / fuel → electrical
- B gravitational potential → kinetic → electrical
- C kinetic → chemical / fuel → electrical
- D kinetic → gravitational potential → electrical

6 Where and at which temperature does evaporation of a liquid occur?

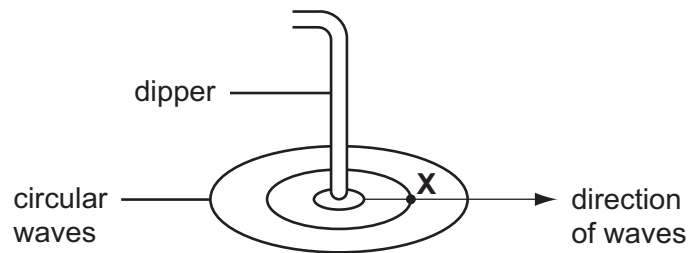
	where	temperature
A	point(s) of heating	a fixed point
B	point(s) of heating	any
C	surface	a fixed point
D	surface	any

- 7 The diagram shows ice cubes being used to lower the temperature of a drink.



What is the **main** process by which the liquid at the bottom of the glass cools?

- A conduction
 - B convection
 - C radiation
 - D a combination of radiation and conduction
- 8 The diagram shows a dipper producing circular waves in a ripple tank.



Which wave property describes the number of waves passing point **X** per second?

- A wavelength
 - B speed
 - C frequency
 - D amplitude
- 9 Which statement about the image formed by a thin converging lens is correct?
- A It is always real and erect.
 - B It is always real and inverted.
 - C It is always virtual and erect.
 - D It may be either virtual or real.

10 What is a property of all electromagnetic waves?

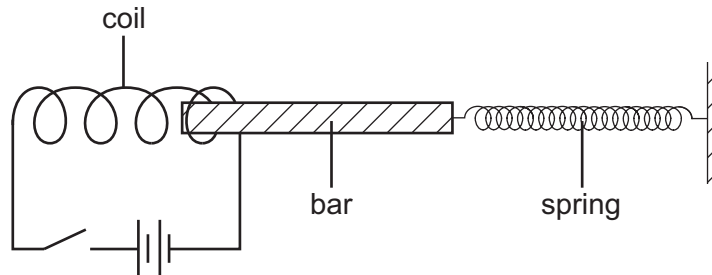
- A They are deflected by magnets.
- B They are positively charged.
- C They travel at the speed of sound.
- D They travel through a vacuum.

11 What is the correct order for the speed of sound in air, steel and water?

	slowest	—————▶	fastest
A	air	steel	water
B	air	water	steel
C	water	air	steel
D	water	steel	air

12 The diagram shows a locking device.

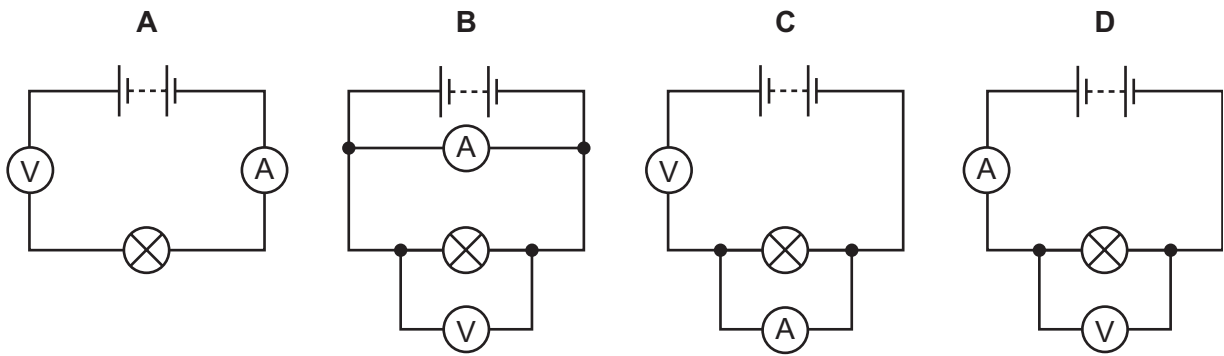
When the current is switched off, the spring pulls the bar to the right.



Which materials should the coil and the bar be made from?

	coil	bar
A	copper	iron
B	copper	copper
C	iron	copper
D	steel	nylon

13 Which circuit can be used to find the resistance of the lamp?

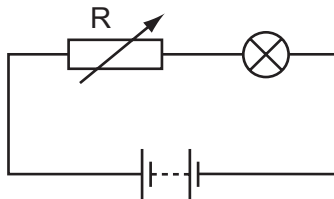


14 An electric lamp uses energy at the rate of 48 W with a 12 V supply.

How much charge passes through the lamp in 2.0 seconds?

- A** 0.25 C **B** 0.50 C **C** 2.0 C **D** 8.0 C

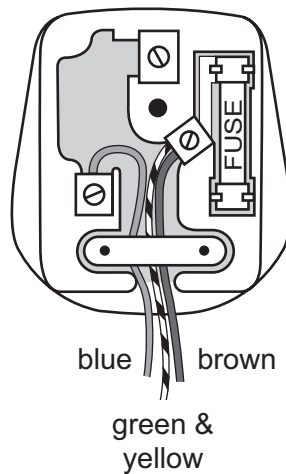
15 In the circuit shown, the brightness of the lamp can be altered by changing the resistance of the variable resistor, R.



This is because varying the resistance changes

- A** the current flowing in the circuit.
B the electromotive force (e.m.f) of the battery.
C the resistance of the bulb.
D the temperature of the battery.

- 16 A plug is wrongly wired as shown. It is connected to an old vacuum cleaner which has a metal case.

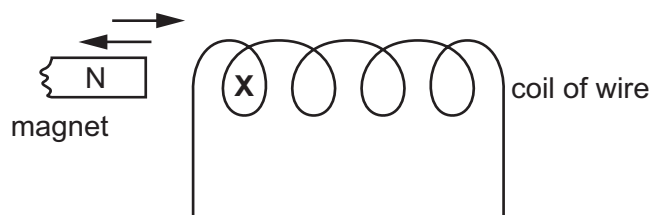


What would be the effect of using the plug wired in this way?

- A The fuse in the plug would blow.
 - B The metal case would be live.
 - C The neutral wire would melt.
 - D The vacuum cleaner would catch fire.
- 17 A heater used on a 250V mains circuit has a 5A fuse in its plug.

Which is the highest power rating for this heater?

- A 50W
 - B 250W
 - C 1000W
 - D 2000W
- 18 The diagram shows the north pole of a magnet moved into, and out of, a coil of wire.



What describes the poles produced in the coil at X by the movement of the magnet?

	north pole in	north pole out
A	N	N
B	N	S
C	S	N
D	S	S

- 19 The table shows how the activity of a radioactive substance changes over a period of time. (Allowance has been made for the background radiation.)

time/minutes	0	5	10	15	20	25	30	35	40
activity/counts per second	114	102	90	83	73	65	57	51	45

What is the half-life of the substance?

- A 73 minutes
 B 57 minutes
 C 30 minutes
 D 20 minutes
- 20 What particles are present in the nucleus of the oxygen nuclide $^{17}_8\text{O}$?

	neutrons	protons
A	9	8
B	17	8
C	8	9
D	9	17

- 21 Which feature of a root hair cell indicates that it is from a plant and not from an animal?

- A cell membrane
 B cell wall
 C chloroplast
 D cytoplasm

- 22 Which cell is biconcave in shape?

- A red blood cell
 B root hair cell
 C white blood cell
 D xylem cell

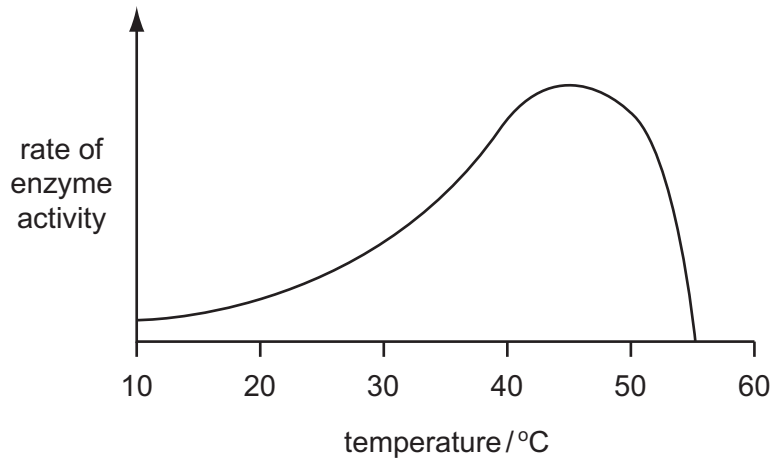
23 The sentence describes the uptake of water by a plant.

Water moves into the root hairs of a plant by osmosis through aX..... permeable cell membrane,Y..... a water potential gradient.

Which words complete spaces X and Y?

	X	Y
A	fully	up
B	fully	down
C	partially	up
D	partially	down

24 The graph shows the relationship between temperature and the activity of the enzyme amylase that breaks down starch to sugar.



From the graph, which statement is correct?

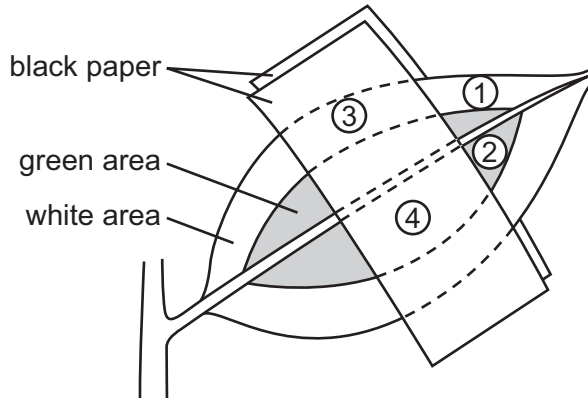
- A Amylase works best at 55°C.
- B Starch will not be broken down below 10°C.
- C Sugar is produced most rapidly at 45°C.
- D The higher the temperature, the faster the amylase works.

25 What is the correct equation for photosynthesis?

- A carbohydrate + oxygen → water + carbon dioxide
- B carbohydrate + carbon dioxide → oxygen + water
- C carbon dioxide + oxygen → carbohydrate + water
- D carbon dioxide + water → carbohydrate + oxygen

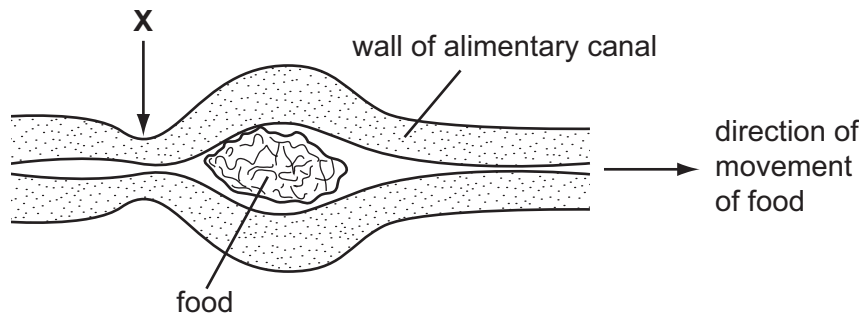
- 26 A plant has leaves that are partly green and partly white. The plant is destarched, and a leaf is partly covered by black paper.

The plant is placed in bright light for several hours. Four discs are then cut from the leaf in the positions shown and are tested for starch.



Which discs contain starch?

- A 1 only B 1 and 2 C 2 only D 3 and 4
- 27 The diagram shows some food moving along the alimentary canal by peristalsis.



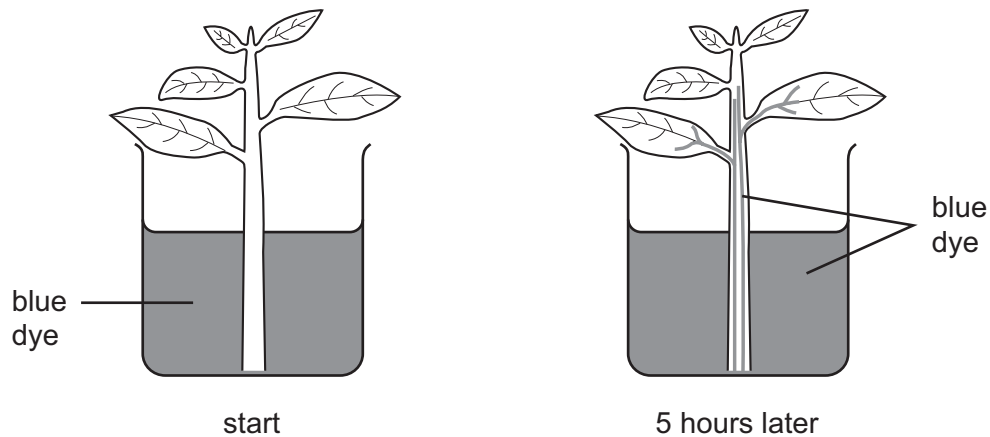
What are the muscles in the wall of the alimentary canal doing at point X?

	circular muscles	longitudinal muscles
A	contracting	contracting
B	contracting	relaxing
C	relaxing	contracting
D	relaxing	relaxing

28 Which substance, released into the alimentary canal, contains no enzymes but speeds up fat digestion?

- A bile
- B intestinal juice
- C pancreatic juice
- D saliva

29 A piece of a plant with a transparent stem was placed in a beaker containing a blue dye and then examined 5 hours later.



Which explains the change in appearance?

- A Blue dye diffuses through the cells of the plant.
 - B Blue dye moves up the stem by osmosis.
 - C Blue dye moves up through the xylem.
 - D Blue dye stains cells in the leaves.
- 30 A woman has fewer red blood cells than normal.

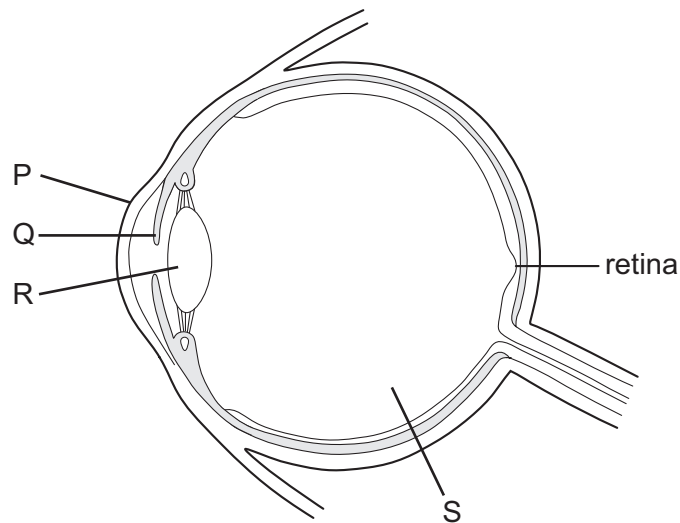
What would be the effect of this?

- A Her blood contains high levels of urea.
- B Her blood does not clot properly.
- C Her body cells do not get enough oxygen.
- D She cannot fight off infections.

31 What are the conditions in the muscles when lactic acid is produced?

	concentration of carbon dioxide	supply of oxygen
A	high	less than oxygen demand
B	high	more than oxygen demand
C	low	less than oxygen demand
D	low	more than oxygen demand

32 The diagram shows a section through the eye.



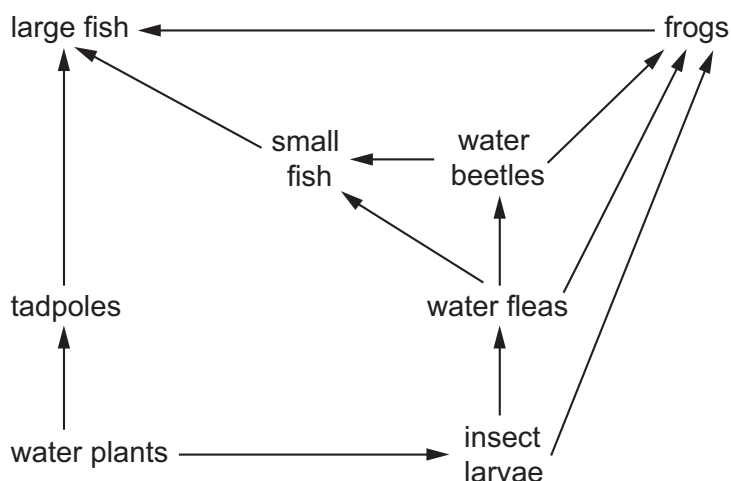
Which pair of structures focus light rays onto the retina?

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

33 What may happen to a heroin addict 48 hours after the drug is withdrawn?

- A** Desire for the drug is reduced.
- B** The addiction is cured.
- C** Tolerance to the drug increases.
- D** Vomiting, sweating and cramp occur.

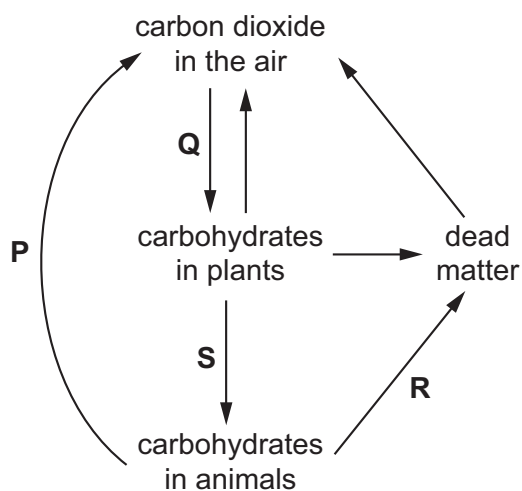
34 The diagram shows a food web from a freshwater pond.



Which organisms are herbivores and which are carnivores?

	herbivores	carnivores
A	small fish	large fish
B	tadpoles	frogs
C	water fleas	insect larvae
D	water plants	water beetles

35 The diagram shows the carbon cycle.



Which parts of the cycle form parts of food chains?

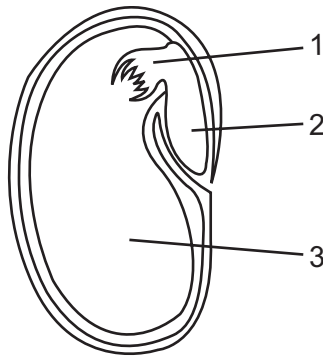
- A** P and Q
- B** P and S
- C** Q and R
- D** R and S

- 36 Which property of modern insecticides helps to keep environmental pollution at the **lowest** level?
- A They accumulate in the bodies of predators.
 - B They are broken down by soil bacteria.
 - C They are easily washed into lakes and rivers.
 - D They are taken up by plant roots.

- 37 What conditions are needed for the germination of most seeds?

	light	oxygen	water
A	✓	✓	✗
B	✗	✓	✗
C	✓	✗	✓
D	✗	✓	✓

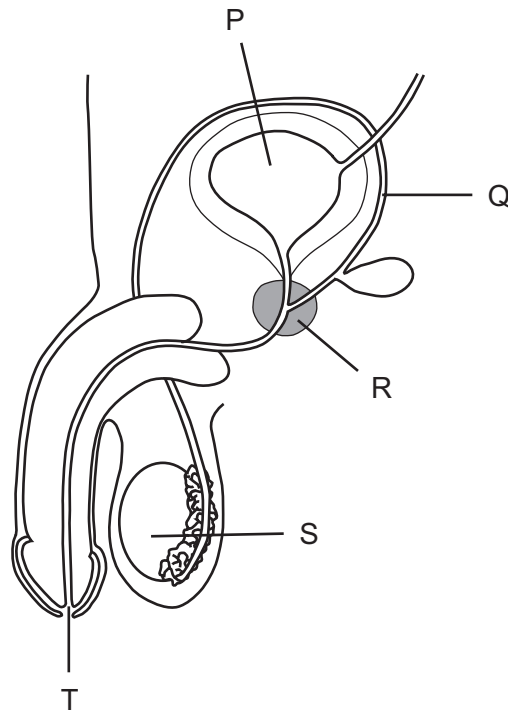
- 38 The diagram shows a section of a seed.



What are the numbered parts?

	1	2	3
A	cotyledon	plumule	radicle
B	plumule	cotyledon	radicle
C	plumule	radicle	cotyledon
D	radicle	plumule	cotyledon

39 The diagram shows part of the male reproductive system.



Which structures produce seminal fluid and sperm?

	seminal fluid	sperm
A	P	Q
B	Q	R
C	R	S
D	S	T

40 In peas, the allele **S** for smooth seeds is dominant over **s** for wrinkled seeds.

200 plants with the genotype **Ss** are self-pollinated and 1500 smooth seeds are collected.

How many wrinkled seeds are collected?

- A** 4500 **B** 2000 **C** 1500 **D** 500

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