

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
AS GCE**

F732/01

GENERAL STUDIES

The Scientific Domain

MONDAY 16 JANUARY 2012: Morning

DURATION: 1 hour

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the Answer Booklet.

OCR SUPPLIED MATERIALS:

**8 page Answer Booklet
(sent with general stationery)**

OTHER MATERIALS REQUIRED:

An electronic calculator

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the spaces provided on the Answer Booklet. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Answer **ALL** the questions in Section A and **ONE** question in Section B.

INFORMATION FOR CANDIDATES

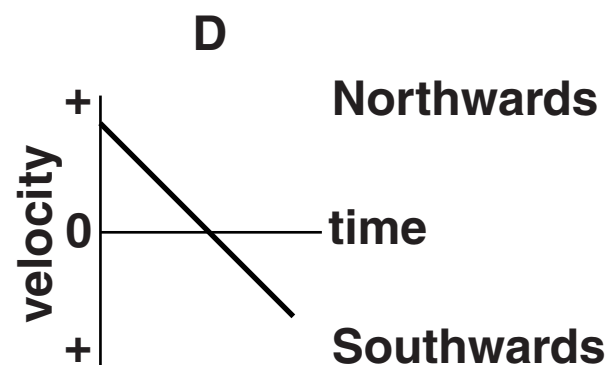
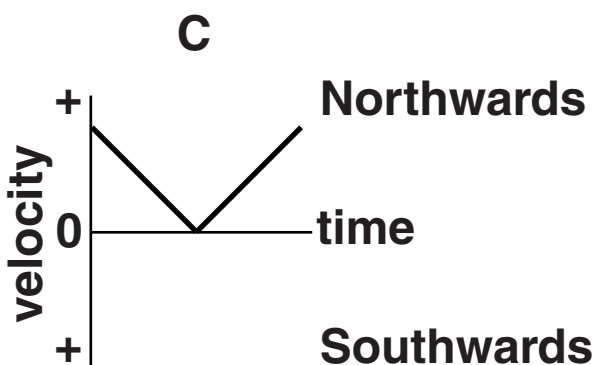
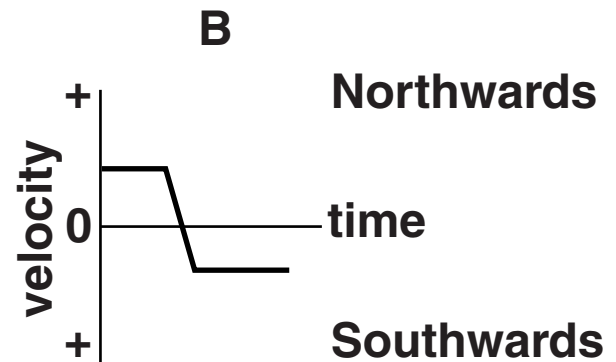
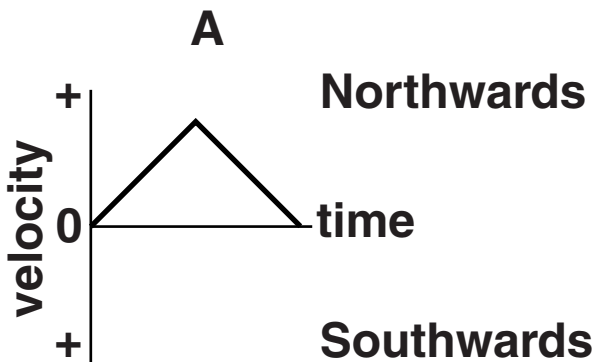
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- You are advised to divide your time equally between Sections A and B.
- **THE QUALITY OF YOUR WRITTEN COMMUNICATION WILL BE ASSESSED, INCLUDING CLARITY OF EXPRESSION, STRUCTURE OF ARGUMENTS, PRESENTATION OF IDEAS, GRAMMAR, PUNCTUATION AND SPELLING.**

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SECTION A

Answer ALL the questions in this section.

- 1 An inclined plane is a flat surface with ends at different heights. To move an object up an inclined plane requires less force than to move the object vertically.
- (a) A young boy stands at the bottom of an inclined driveway and kicks a soccer ball. The ball rolls northward up the driveway and then rolls back to him. Which ONE of the following velocity-time graphs (A, B, C, or D) most accurately portrays the motion of the ball as it rolls up the driveway and back down?



Explain your answer. [4]

- (b) Describe, using graphs if you wish, how the movement of the ball would change if:**
- (i) the drive was steeper [4]**
 - (ii) the ball was kicked harder up the original slope. [4]**
- (c) Describe and explain TWO everyday uses of an inclined plane (other than a driveway) where objects are moved upwards. [6]**
- (d) Describe and explain ONE example of an inclined plane where movement takes place freely down the inclined plane. [2]**

- 2 (a) A hollow sphere of radius R_s is full of water. A student then pours all the water from the sphere into a cylinder of radius R_c . Calculate the height (H_c) of the water in the cylinder if:

$$R_s = 3 \text{ cm and } R_c = 2 \text{ cm}$$

The volume of the water in the sphere (V_s) is given by the formula

$$V_s = (4/3) \pi R_s^3$$

The volume of the water in the cylinder (V_c) is given by the formula

$$V_c = \pi R_c^2 H_c$$

You may assume π to be equal to $22/7$ or 3.14 if needed.

You must show clearly how you reached your answer. [6]

- (b) Suggest why the calculation of the height of the water in the sphere would be more complex if the student had poured the water from a full cylinder to partly fill a sphere. [4]

Section A Total [30]

SECTION B

Answer ONE question from this section. Your answer should be in continuous prose.

- 3 A number of organisations offer gap year conservation projects that include working with a local community, for example to develop eco tourism, forestry or marine conservation.**

Examine TWO advantages and TWO disadvantages for the local people of such projects taking place in their community. [30]

TURN OVER FOR SECTION B, QUESTION 4

4 Organs that can be transplanted include the heart, kidneys, liver, lungs, pancreas, intestine, thymus, and skin. Worldwide, the kidneys are the most commonly transplanted organs.

In 2009, there were 8000 people in the UK on waiting lists for an organ transplant.

Ideas to reduce these waiting lists include:

- **cash payments to donor card holders each year**
- **payment of funeral expenses for donors**
- **jumping the NHS queue, for those carrying a donor card**
- **advertising for organ donors in less developed countries**
- **compulsory donation upon death**
- **allowing doctors greater freedom to use more animal organs in transplants**
- **giving scientists funding to develop alternative treatments.**

Select TWO ideas from the list, ONE that you feel is the MOST appropriate way to reduce the waiting list and ONE that is the LEAST appropriate. Justify your choices. [30]

5 Science has identified many worrying issues for everyday life on earth. These include:

- **obesity and its consequences**
- **global warming**
- **increased life expectancy.**

Identify ONE other scientific issue that you think is particularly worrying. Argue the case for the issue you have identified being of HIGHER priority for scientists than any ONE issue from the list above in protecting the quality of everyday life. [30]

Section B Total [30]

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