

Monday 16 January 2012 – Morning

AS GCE GENERAL STUDIES

F732/01 The Scientific Domain

Candidates answer on the Answer Booklet.

OCR supplied materials:

- 8 page Answer Booklet
(sent with general stationery)

Other materials required:

- An electronic calculator

Duration: 1 hour



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.
- Do **not** write in the bar codes.

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.**
- This document consists of **4** pages. Any blank pages are indicated.



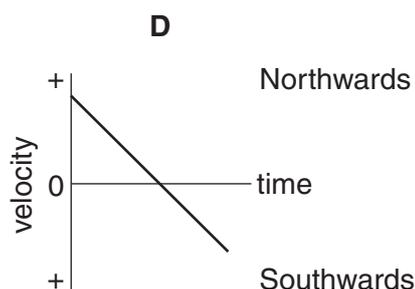
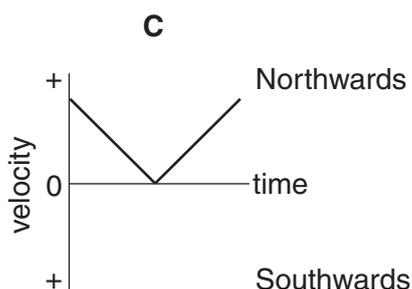
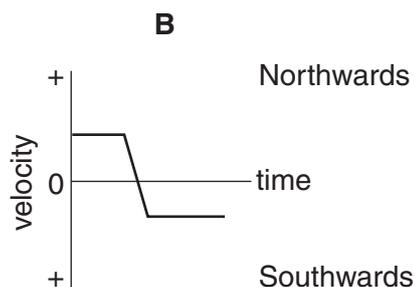
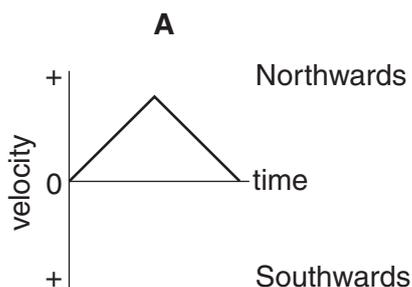
**A calculator may
be used for this
paper**

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

$$V_s = \frac{4}{3} \pi R_s^3$$

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]

- 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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