



ADVANCED SUBSIDIARY GCE
GENERAL STUDIES
 The Scientific Domain

F732

Candidates answer on the Answer Booklet

OCR Supplied Materials:

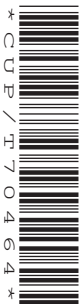
- 8 page Answer Booklet

Other Materials Required:

- An approved calculator

Thursday 14 May 2009
Afternoon

Duration: 1 hour

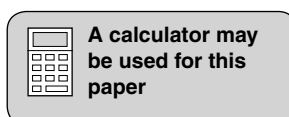


INSTRUCTIONS TO CANDIDATES

- Write your name in clearly capital letters, your Centre Number and Candidate Number in the spaces provided on the Answer Booklet.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- If you use additional sheets of paper, fasten the sheets to the Answer Booklet.
- Answer **all** 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.
- **Where an answer requires a piece of extended writing, 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.



Section A

Answer **all** the questions in this section.

- 1 Two ice cream sellers who are in competition arrive at a crowded beach.

Fig. 1 shows where the two ice cream sellers set up their stalls on the beach.

Fig. 1

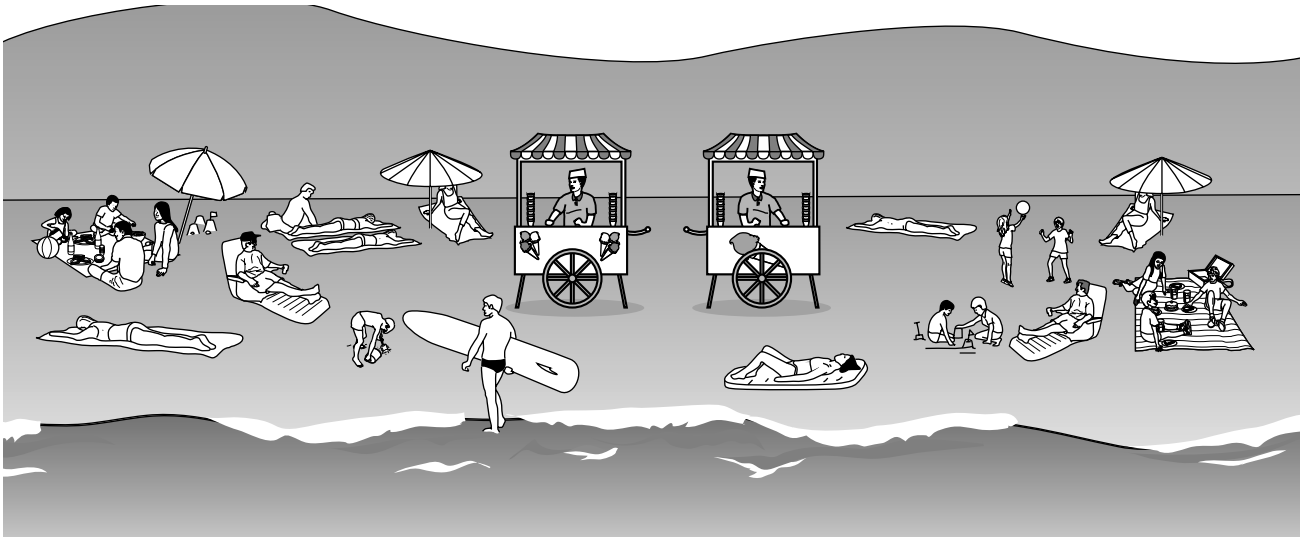
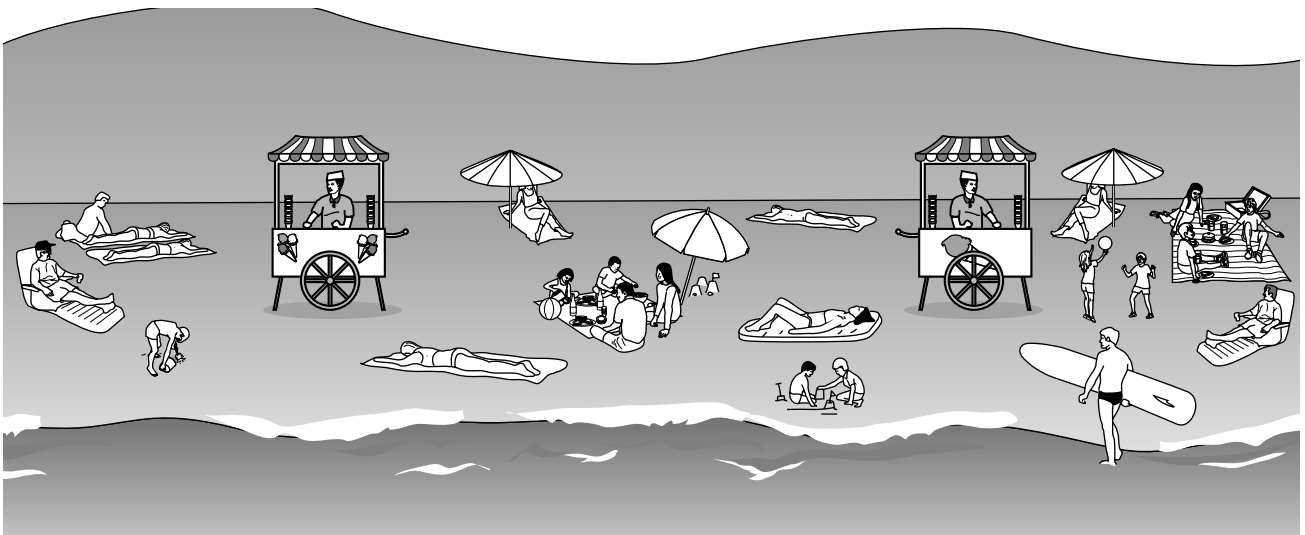


Fig. 2 shows another possible pair of locations for the sellers on the beach.

Fig. 2



- (a) What reason might both ice cream sellers give for selecting their location shown in Fig. 1? [3]
- (b) Why would the locations shown in Fig. 2 be better than those in Fig. 1 for customers on the beach? [3]
- (c) How might the thinking behind the location of the two ice cream sellers in Fig. 1 and Fig. 2 be applied more generally to the location of shops? [6]

- 2 (a) Examine Fig. 3 which shows a number square.

Fig. 3

8	1	6
3	5	7
4	9	2

What do you notice about the pattern of numbers in the square? [3]

- (b) A mathematician named Mersenne devised some numbers that are given by the formula $2^n - 1$. For example if $n = 2$ the Mersenne number would be 3.
- (i) Calculate the value of the Mersenne numbers for values of n from 3 to 6. [4]
 - (ii) What pattern do you discover for the Mersenne numbers for values of n from 2 to 6? [5]
 - (iii) Prime numbers are those numbers greater than 1 that cannot be divided by any number except themselves and one.

Show that when $n=4$ and $n=6$ the Mersenne numbers generated are not prime numbers. [6]

Section A Total [30]

Section B

Answer **one** question from this section. Answers must be in continuous prose.

- 3 Surgeons regularly perform successful organ transplants but the extent of their work is restricted by a lack of available organs from volunteer donors. Describe **two** arguments for and **two** against the compulsory donation of organs to hospitals. [30]
- 4 Scientists are able to forecast with some accuracy certain events. Describe **one** type of event where forecasts have proved helpfully accurate and **one** where they have been less accurate. Suggest **two** reasons for the difference in the accuracy of forecasts. [30]
- 5 'People say that hindsight is 20:20.'

Describe an environmental problem with which you are familiar. Explain how people have attempted to manage the issue. How might hindsight suggest an alternative plan? [30]

Section B Total [30]

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