OCR
RECOGNISING ACHIEVEMENT

Thursday 23 May 2013 – Afternoon

AS GCE GENERAL STUDIES

F732/01 The Scientific Domain

F7302506133

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Scientific calculator

Duration: 1 hour

F7321

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. 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.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined pages on pages 11–12 of this booklet. The question number(s) must be clearly shown.
- 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 **12** pages. Any blank pages are indicated.

A calculator may be used for this paper

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SECTION A

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

1 **(a)** Students in a college are carrying out an investigation into the effect of exercise on skin temperature. There are 880 people in the college and an alphabetical list is available to help the students choose a sample for the investigation.

Explain **two** ways in which the students could select a sample from the college population.

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..... **[6]**

(b) Some students have recorded their results in Fahrenheit (°F) and need to convert these to Centigrade (°C).

(i) One student uses estimation, as follows:

- subtract 30 from the temperature in °F
- halve the answer to give the temperature in °C.

Use this method to convert 98 °F to °C.

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..... **[2]**

(ii) Another student uses the formula

$$°C = 5/9\ (°F - 32)$$

Use the formula to convert 98 °F to °C, giving your answer to 1 decimal place.

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(iii) Explain **two** reasons why estimated measurements may be inappropriate for use in a scientific investigation.

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..... **[6]**

2 **(a)** The following equations are formed by addition.

$$1 + 2 = 3$$

$$4 + 5 + 6 = 7 + 8 = 15$$

$$9 + 10 + 11 + 12 = 13 + 14 + 15 = 42$$

$$16 + 17 + 18 + 19 + 20 = 21 + 22 + 23 + 24 = 90$$

Identify and explain **two** patterns in the numbers.

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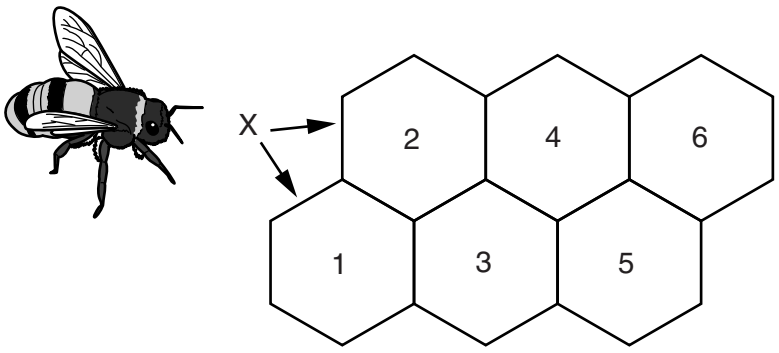
..... **[4]**

(b)



A bee moves from starting point X into its hive. It can **only** enter the hive at either cell 1 or cell 2. Once inside the hive, the bee can move **only** to an adjacent cell with a higher number. So, for example, the bee has only one possible route to cell 1, but to get to cell 2 it has two possible routes – it can either go directly to cell 2, or it can go to cell 1 and then into cell 2.

(i) Work out how many possible routes the bee has to **each** of the cells 3, 4 and 5.

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(ii) Predict the number of possible routes the bee has to cell 6 and explain how you made your prediction.

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..... **[5]**

SECTION B

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

3 The UK has a target of increasing its use of renewable energy sources to 15% of its total energy consumption by 2020. Renewable energy sources include for example, water, solar, wind, biomass and geothermal.

Describe **four** disadvantages of using renewable energy sources, giving examples from your own knowledge and experience. **[30]**

4 Scientists have contributed solutions to many medical problems. Current problem areas include:

- ageing population
- obesity
- drug and alcohol problems
- mental health problems.

Funds for medical research are limited.

Select **two** of these problem areas. Argue the case for giving **one** of them priority over the other for funding. **[30]**

5 Scientists involved in space exploration are experimenting with the possibility of growing food in space.

Describe how, in the future, this research may have benefits on earth and in space. **[30]**

Write the number of the question answered in the margin.

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margins.