

UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE
Joint Examination for the Higher School Certificate
and General Certificate of Education

GENERAL PAPER
OCTOBER/NOVEMBER SESSION 2001

8001/1, 2

2 hours 40 minutes

Additional materials:
Answer paper

TIME 2 hours 40 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number, candidate number and paper number (1 or 2) in the spaces provided on the answer paper/answer booklet.

Answer **two** questions.

Answer **one** question from Paper 1 and **one** question from Paper 2.

Write your answers on the answer paper.

Begin your answer to Paper 2 on a new and separate sheet of paper.

At the end of the examination, hand in your answers to Paper 1 and Paper 2 separately.

If you are unable to answer a question in any one Paper, send in a blank sheet giving your name, Centre number, candidate number and the number of that Paper.

INFORMATION FOR CANDIDATES

In Paper 1, all questions carry equal marks.

In Paper 2, the number of marks is given in brackets [] at the end of each question or part question.

The total time of 2 hours and 40 minutes includes ten minutes for you to study the questions before you begin your answers. You may make notes during this time if you wish.

You are advised to spend no longer than 1 hour 15 minutes on Paper 1. You should write between 500 and 800 words.

INSTRUCTIONS TO SUPERVISORS

You are requested to place the answers belonging to the two papers in separate envelopes which should be marked 1 or 2.

This question paper consists of 7 printed pages and 1 blank page.

Paper 1

- 1 Does one country ever have the right to influence the internal affairs of another?
- 2 Is it more important to deal with the causes of crime than its punishment?
- 3 Is terrorist action ever justified?
- 4 Can countries with a history of conflict achieve real peace and trust?
- 5 'A family with no children is not a family at all.' Discuss.
- 6 'The environment is being harmed more by human activity than natural disasters.' Do you agree?
- 7 Would education be improved if it took place at home by means of modern technology?
- 8 What are the attractions and dangers of trying to predict future events and developments?
- 9 Does sport do more to encourage international rivalry than to overcome it?
- 10 'The camera can never lie.' Is this true?
- 11 'Media celebrities are over-rated and over-paid.' Do you agree?
- 12 'Science fiction is simply fantasy and escapism.' Discuss.

Paper 2

- 13 Read the following passage, which was written in December 1998, and then answer all the questions below.

As the 20th century draws to a close, does science stand at the beginning of an epic period or at the end? Research over the past 100 years has roamed across an extraordinary variety of frontiers: space exploration; the computer revolution; widespread vaccination; the first heart-transplant operation; air travel; test-tube babies; the atomic bomb; genetically engineered foods available in supermarkets; unravelling the structure of DNA. Some doubters, therefore, argue that the 21st century will not deliver similarly profound advances because the golden age of discovery is over. Their view is that the fundamentals of science have been mastered. The Big Bang theory tells us how the Universe started; we now understand DNA, the code of life; technologists are close to creating a robot as intelligent as any human being.

Others, however, argue that the astounding achievements of the past century do not spell the end of science. Rather, they will do one of two things – pave the way for future glories or crumble in the face of further evidence, giving rise to completely new theories. One example of the former is space exploration – without the Moon landings, we wouldn't have the International Space Station, on which construction began this year. On the other hand, the Big Bang theory of how the Universe began will undergo a radical overhaul since some problems with the theory stubbornly refuse to be solved. For example, there is less mass in the Universe than predicted. While some have confidently expected that the 'missing mass' would be located, it has yet to be found. Could the next few years throw up a completely new theory of how the Universe started?

Robotics and artificial intelligence, commonly known as AI, are two related fields of research which promise much. One of the best known schemes is the Cog Project – a humanoid robot that can act, talk and even look like a person. Hans Moravec, an AI pioneer, believes that by 2030 robots will be able to visualise tasks and assess the consequences of their actions. By 2040 robots should be able to reason at least as efficiently as people. Moravec even envisages a world where robots will display 'superhuman reasoning'. By 2050, emotions will be commonplace because they will help machines to bond with their human masters. All this, however, raises an intriguing question: will robots be so similar to us that they, too, will start wondering where they came from? As well as showing awareness of the world, will they be aware of themselves? In other words, will they be *self-conscious*? By the middle of the next century, we may even begin to wonder whether such advanced robots, with their enormous mental capacities and physical strength, pose a threat to their human inventors.

The cyborg – the fusion of man and machine – is another plausible prospect in our lifetime. Doctors have already devised silicon chips that can replace damaged retinas and therefore restore sight, while paralysed individuals can control computers by twitching an eyelid or through the power of thought alone (using the tiny electrical impulses in the brain). There is one barrier to controlling the human body using silicon chips in that the complete electrical wiring for the brain has never been charted. Yet some scientists estimate that by 2010 it will be feasible to dissect a brain into a million slices to determine how each cell is connected. It would be comparable to the Human Genome Project, a \$3 billion study aimed at listing the 100,000 or so genes in the body. This project, in its turn, has given rise to some astonishing predictions of how biology will advance. Francis Collins and Walter

Gilbert, who run the Human Genome Project, expect that by 2010 we will have genetic profiles of as many as 5,000 hereditary diseases. By 2030 we will each have access to our individual DNA codes, perhaps on a compact disc. Biologists predict that this will revolutionise medicine. Visiting a doctor in 2030 will involve a scan of your DNA code for signs of disease, then recommendations for preventive therapy, some of it gene-based. 50

Next century, scientists will begin thinking seriously about how to power the planet, given that fossil fuels are expected to last only a few more decades. Physicists have already been trying to create energy from the process of fusion. They are aiming to extract energy from seawater by fusing nuclear particles of hydrogen together. Inevitably, there are great problems with this technique. Nevertheless, scientists engaged on this fusion project still expect the technique to light up the planet one day. By 2010 the principle should have been demonstrated; by 2050 fusion could be a common energy source. Harnessing energy from the Sun is another prospect. By 2025 some scientists predict that half the world's electricity will come from the Sun. These areas of research are as exciting and profound as any that have challenged scientists this century. 55 60

Note: When a question asks for an answer IN YOUR OWN WORDS AS FAR AS POSSIBLE and you select the appropriate material from the passage for your answer, you must still use your own words to express it. Little credit can be given to answers which only copy words or phrases from the passage.

- (a) Without referring to any specific scientific achievements and **using your own words as far as possible**, summarise the two main arguments put forward as to why the 21st century will not be another 'golden age of discovery'. [4]
- (b) Nine scientific achievements are listed in the first paragraph as having been among the most significant during the past 100 years. Choose **one** of the following and briefly consider its possible advantages and disadvantages and the scale of its impact:
- (i) the computer revolution;
 - (ii) test-tube babies;
 - (iii) the atomic bomb. [5]
- (c) The construction of the International Space Station and the controversy over the Big Bang theory are quoted as examples of two different ways in which science may develop. Explain **in your own words** what these two ways are. [2]
- (d) Give **two** reasons of your own why research into the Big Bang theory could have little appeal to the general public. [2]
- (e) (i) Explain the meaning of **six** of the following words as they are used in the passage. You may write the answer in one word or a short phrase.
structure (line 6); fundamentals (line 8); radical (line 18); intriguing (line 31); plausible (line 37); hereditary (line 49); therapy (line 52); harnessing (line 61). [6]
- (ii) Use the six words that you have chosen from the list above in six separate sentences to illustrate their meanings as used in the passage. Your sentences should not deal with the subject matter of the passage. [6]
- (f) Much of the article is devoted to four major developments in technology that may take place during the next fifty years.

In a summary of no more than 150 words, explain their advantages and any possible drawbacks or difficulties. [10]

14 During a period of acute and prolonged recession, the Government of Jodelbic, a very small country whose main export is bananas, is considering the closing down of ONE of two public buildings in the capital, Shebatha, in order to save costs. The first is the National Museum and the second is the Shebatha Folk Theatre. Study the information below and then answer all the questions.

- 1 The Folk Theatre is in the middle of a large area of substandard housing which was due to be demolished before the recession began.
- 2 During the last twelve months, the Folk Theatre has been able to afford only two groups of actors, dancers and singers from abroad.
- 3 As a condition of the original international sponsorship, no entry fee can be charged for the National Museum.
- 4 In days gone by, groups who have performed at the Folk Theatre have often gone on successful international tours.
- 5 The National Museum was the favourite project of Evelyn Archimac, founder of the Republic of Jodelbic.
- 6 Dramas, songs and dances have been traditionally performed in the open air.
- 7 The National Museum has acquired few new exhibits since the start of the recession and the end of international subsidies.
- 8 The National Museum is part of a modern development in the centre of Shebatha.
- 9 Stage performances at the Folk Theatre have featured in the drive to increase tourism.
- 10 The Banana Growers Federation has expressed an interest in taking over the Folk Theatre to promote its image at home and abroad.
- 11 Some of the performances at the Folk Theatre have made fun of the democratically elected Government.
- 12 Beggars frequently sleep under the arches that are the most prominent feature of the exterior of the National Museum.
- 13 The Folk Theatre is always full to capacity despite the recession and despite substantial increases in the price of tickets.
- 14 The National Museum was built, at great expense, from funds provided by the international community and cannot be used for any other purpose.
- 15 The National Museum has featured in many films about Jodelbic.
- 16 Attendances at the National Museum have steadily declined in recent months.
- 17 The Folk Theatre, an old warehouse, is in urgent need of structural repair.
- 18 The National Museum houses a unique collection of butterflies donated by Evelyn Archimac.

- 19 Many of the performances at the Folk Theatre bring to prominence previously unknown actors, dancers and singers.
- 20 The National Museum contains a great number of exhibits from the colonial period but comparatively few from more recent times.

Note: When a question asks for an answer IN YOUR OWN WORDS AS FAR AS POSSIBLE and you select the appropriate material from the passage for your answer, you must still use your own words to express it. Little credit can be given to answers which only copy words or phrases from the passage.

- (a) In no more than 150 words, write a letter to the 'Jodelbic Gazette' explaining why the National Museum should be closed rather than the Folk Theatre. **Use your own words as far as possible.** [15]
- (b) In no more than 150 words, write a letter to the 'Jodelbic Gazette' explaining why the Folk Theatre should be closed rather than the National Museum. **Use your own words as far as possible.** [15]
- (c) In about 50 words, explain which details from the information provided above could be used against the present Government by their many opponents. [5]

15 An international relief organisation has, over the past eighteen months, sent aid in various forms to four areas struck by different kinds of disaster. Details of these are given below.

- (i) **Atambra**, a densely populated peninsula, has been devastated by a powerful earthquake.
- (ii) In **Bolebo**, a vast agricultural country situated on the Equator, famine has reduced thousands to starvation, following yet another severe drought.
- (iii) **Cortensov**, a city on the banks of the River Treju, has been largely submerged as a result of a dam bursting upstream.
- (iv) **Dramende**, a small town in the midst of the rain forest, has been threatened by raging fires.

(a) For each of these four areas, outline the various kinds of assistance that the relief organisation could have offered the inhabitants in terms of personnel, supplies and equipment. Set out your answers as (i), (ii), (iii) and (iv). Write no more than 50 words on each area. [20]

(b) Identify the area, a different one in each example, which would have benefited most from the following and briefly explain why:

- (i) inflatable boats;
- (ii) explosives;
- (iii) specialists in breathing problems;
- (iv) vitamin tablets.

[8]

(c) Pick the **one** item in the list below that the relief organisation would not have sent to any of the disaster areas and briefly explain why:

automatic washing powder; baby clothes; blankets; face masks; hoses; ploughs; seed; tents. [2]

(d) In all four situations, the forces of nature were the immediate cause of the suffering endured by the communities of Atambra, Bolebo, Cortensov and Dramende. Human greed, ignorance, incompetence or wickedness, however, may have contributed in a number of ways to each disaster.

Choose **one** disaster from those mentioned and, in not more than 50 words, explain how human beings may have been at fault. [5]