UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Level

THINKING SKILLS **9694/43**

Paper 4 Applied Reasoning **October/November 2011**

1 hour and 30 minutes

Additional Materials: Answer Booklet/Paper

1209810840

READ THESE INSTRUCTIONS FIRST

If you have been given an Answer Booklet, follow the instructions on the front cover of the booklet.
Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE ON ANY BARCODES

Answer **all** the questions.
Start each question on a new answer sheet.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question.

This document consists of **7** printed pages and **1** blank page.

1 *Study the passage and answer the questions that follow.*

Between the years 1970 and 2000, there was a 60% increase in students in the US who opted to study medicine, but since then the numbers have been on the decline, falling by 30% from 2000. This is because of the spread of the net and information technology. Since 2000 there has been an increase in uptake of students for places in software, IT, and media studies by 30%. Clearly the medical profession is a less appealing career option for many than the world of enterprise and entrepreneurism.

Furthermore, practising doctors are steadily withdrawing from the profession in countries such as the United States, UK, Canada and even India. In a survey conducted by the Physicians' Foundation in the US, almost half of practising doctors plan to cut back or quit medicine. A press release from the survey said 50% – or more than 150 000 – of practising doctors say they plan to reduce the number of patients they see or stop practising entirely over the next 4 years. These doctors too may be drawn into other careers and occupations. The survey sent out 27 000 questionnaires and about 12 000 were completed and returned.

We are on a slope of very worrying decline in human resources where medicine is concerned. We need to find ways of re-motivating our young people to take up traditionally acclaimed disciplines such as medicine.

(a) Identify **three** points that weaken the credibility of the statistics in the passage. [3]

(b) "We are on a slope of very worrying decline in human resources where medicine is concerned."

Do you think the evidence in the second paragraph is sufficient for this inference to be drawn? Briefly justify your answer. [2]

Questions 2, 3 and 4 refer to Documents 1 to 5.

2 Briefly analyse HGA's argument in Document 1: Equality in Science and Technology, by identifying its main conclusion and reasons, as well as any intermediate conclusions and counter-arguments. [6]

3 Give a critical evaluation of HGA's argument in Document 1, by identifying and explaining strengths, weaknesses, implicit assumptions and flaws. [9]

4 'Gender equality in science and technology does not matter.'

To what extent do you agree with this statement? Construct a well-reasoned argument in support of your view, commenting critically on some or all of Documents 1 to 5, and introducing ideas of your own. [30]

DOCUMENT 1

Equality in Science and Technology

Gender equality in science and technology should be about men and women having equal respect for each other and not about equal rights. It is not 'equal rights' to think that because science and technology is getting impoverished, owing to decreasing numbers of scientists and engineers, the solution is to draw more women into these professions. This is tantamount to forcing women into areas they by natural choice would not opt for (you use force only on the weaker) – that is not equal rights. If men cannot be bothered to opt for careers in science and technology, why look to women?

If men are naturally better at (or more interested in) science and technology, we should not force women to be what they are not supposed to be. Researchers say that women are naturally better at verbal skills than men, but you don't therefore see men getting all uptight about it and pushing young boys to pursue a social service career, which needs verbal skills. Besides, if we were to give these girls 'extra training' in science and technology, are the young boys going to have the opportunity for this training?

It would be more sensible to let each sex do what they are good at. Instead of trying to compete, boys should be given the extra training in science and girls given extra training in social skills. If you find something one of the sexes is good at, why not encourage them to really excel in that field, rather than set the opposite sex up against them? Are we so caught up in 'equal rights' to the point where we are nurturing young girls to think that they have to fight the boys and overcome them? If you give Lego to a girl and a doll to a boy, I am sure you will not be at all surprised if your daughter creatively builds a doll's house from the Lego and your son enjoys dismembering the doll by running his toy bulldozer over it. Gender equality activists who challenge natural perceptions of men and women and ask them to think differently are biased and insecure people with grudges against the opposite sex.

Human beings of both sexes are always seeking equality because they want respect and recognition for their abilities. True equality between men and women is realised when they respect each other and that includes respecting each other's differences. Therefore we can assert two facts: that women are different from men, but they are equal to men. It also explains why, historically, men have made the most contributions in scientific discoveries and technological inventions. Women do not, on the whole, have the same brainpower as men – they cannot problem-solve as well as men can (even if they are more perceptive and can identify problems more quickly). However, women have the unique capability to bring up healthy, stable families where the fathers can be the great scientists and innovators, and children can grow up in their fathers' footsteps. Men need the respect of women to encourage, motivate and bring out the best in them. We read in many autobiographies that the source of inspiration for some of the greatest men in the history books was their women. Most women would prefer to be acclaimed and respected as the inspirational force behind the movers and shakers of the world than be made to do the moving and the shaking themselves. If the sexes can stop thinking that they have to fight each other for equal rights, and respect each other for who they are, science and technology will benefit.

HGA

DOCUMENT 2

The Problem of Gender Inequality

Over the past few years I have been privileged to be associated with two major United Nations initiatives on gender in relation to science and technology. There are widely differing reasons for gender inequality in science and technology. Different situations exist in different countries and regions of the world. They include cultural differences which in some countries serve to discourage girls from studying science in schools or universities, and from pursuing scientific careers. Other reasons frequently have to do with discrimination, career interruptions due to childbirth and family responsibilities, gender stereotyping of science and technology, and the relative lack of women in policy- and decision-making positions.

I have come to believe that the attainment of gender equality in science and technology is one of the most important tasks facing all countries in the twenty-first century. These are my reasons.

Human rights and social justice. All individuals should have equality of opportunity to a science education and to a scientific career. Women and men should benefit equally from advances in science and technology.

Scientific and economic reasons. If women are not given equal opportunity to become scientists and engineers then a country denies itself its full complement of scientifically creative minds. This can be a serious handicap both to the development of science and to the generation of wealth in an increasingly competitive world.

Social reasons. Women frequently perform different roles and tasks both within and outside the home from those performed by men. It is important that both men and women are able to bring a scientific and technical education to bear on the performance of these roles and tasks.

Reasons of insight. Some women, it has been suggested, bring different insights, values, motivations and methods of work to their scientific jobs than do most men and other women. The inclusion of more women in science will enrich the total pool of talents, insights and motivations, and increase the probability that science will serve the needs of all humanity.

In a small number of countries in the world there appear to be few major obstacles to women pursuing rewarding careers in science and technology. In most of the world, however, there are major problems.

Geoffrey Oldham
Conference on Gender, Science and Technology, 26 October 2000

DOCUMENT 3

In 2003 the Research Council in Norway awarded funding to 26 Outstanding Young Investigators (OYI) in science and technology. Only 4 of these were women. Most of the applicants who were accepted worked within the natural sciences and in the field of technology. Under criticism, the Research Council responded by saying that the allocations reflected the applications they had received. They insisted that the selection process had been a question of quality, and quality alone. No other considerations were made.

But something happened before the second announcement in 2007. In 2003, women had made up only 15% of the award recipients. They now made up 40%!

What brought this about? A number of changes had been made to the process of application. The application guidelines were altered. Women were encouraged to apply, and the Research Council stated that all fields of research were welcome. The phrasing was also made more inviting. The application form stressed that the applicants need not be top scientists, but the OYI scheme could help them along the way. This led to the number of female applications shooting up. Another development was that in 2003 the applications had been treated in the traditional way, i.e. each application was assessed by an individual referee. But in 2007, three panels of international experts from different subject fields assessed the applications together.

DOCUMENT 4

Fewer Women Study Information Technology

Women are increasingly shying away from information technology (IT) courses in Brazil in line with a global trend, according to the Brazilian Computer Society.

20 years ago, women filled nearly 50% of the seats in university classrooms where IT was taught. But that proportion has fallen steadily since then.

Only 3049 (or 22%) of the 13 606 students who graduated in computer science and engineering in 2004 were women, according to Ministry of Education statistics.

In IT graduate courses, women still represent 30% of the professors, but that is a holdover from the past which cannot be maintained, according to Professor Medeiros of Campinas. Another academic, Professor Rapkiewicz, explained that computer sciences emerged from the field of mathematics rather than engineering. Traditionally engineering is seen as a more masculine field. The tendency to associate information technology courses with engineering contributed to the decline in the number of female students.

Female students are also a minority in other areas of engineering, although the proportion has risen, even if very slowly. The proportion rose by 5% in the last 10 years at the Federal University. Professor Rapkiewicz pointed out that society at large loses out as a result of the reduced presence of women in this field, as they do any time one gender dominates a specific area. “Quality and creativity are reduced... because homogeneity means less debate and less questioning.”

Mario Osava, 3 April 2007
Inter-press service

DOCUMENT 5

Harvard Professor: "Men Naturally Better at Science, Maths"

There were about 50 academics (half of them women) at a conference which was convened to discuss women and minorities in science and engineering.

Dr Lawrence Summers, the President of Harvard University, one of America's most prestigious universities, arrived after the morning session. In his lunchtime speech he suggested that men outperformed women in maths and science because of genetics, and that women have less innate ability in these fields. Dr Summers says the theory that men have more natural ability at science was based on research, not his own opinions. His comments made it into the public arena when it was revealed that some women had walked out of the room.

Nancy Hopkins and Denise Denton attended the conference.

NANCY HOPKINS (Professor of Biology at the Massachusetts Institute of Technology): This man is, in effect, a spokesman for American education and the American university system. 50% of his students are some of the brightest young women in America, and if he feels that these people don't have the aptitude to get to the top, then he's got no business leading them. That was my feeling, and I began to feel really sick.

DENISE DENTON (Chancellor-designate of the University of California, Santa Cruz): I think it is important to engage with all of these points, and I'm happy to debate them. Now, I'm not in a position to debate the innate ability point, that's not my field. But I think that a lot of people are going to be debating the technical aspects of 'nature versus nurture'.

Lisa Millar, 19 January 2005
The World Today

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