



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Level

THINKING SKILLS

9694/04

Paper 4 Applied Reasoning

May/June 2009

1 hour and 30 minutes

Additional Materials: Answer Booklet/Paper

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

Electronic calculators should be used.

Answer **all** the questions.

Start each question on a new answer sheet.

At the end of the examination, fasten all your work securely together.

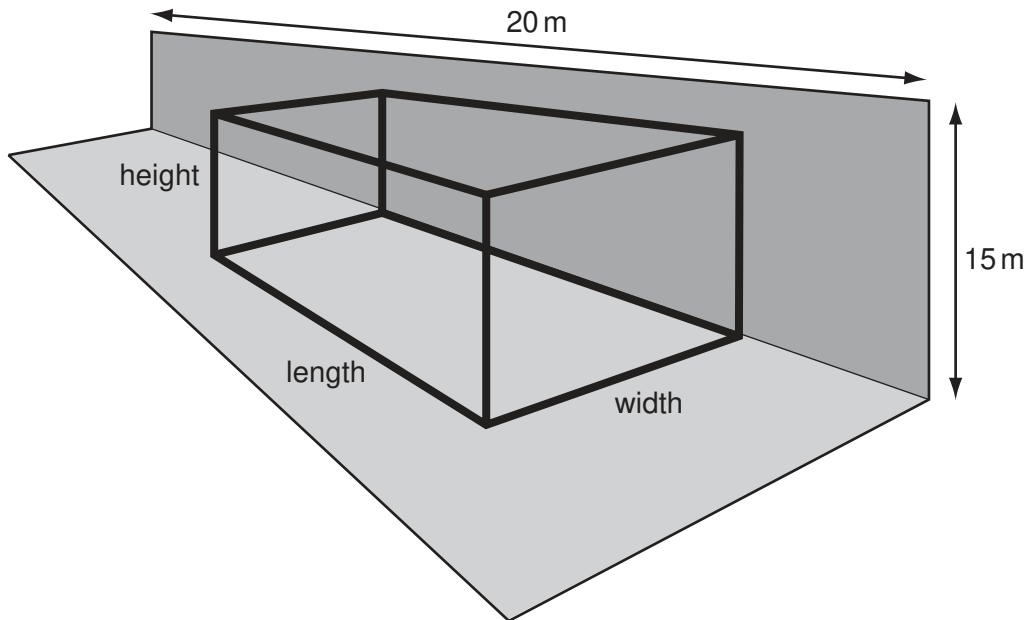
The number of marks is given in brackets [] at the end of each question.

This document consists of **11** printed pages and **1** blank page.



- 1 Study the following evidence and answer the questions which follow. Show your working.

A cage is to be built to house some exotic birds. It is to be built against a wall, as shown in the diagram, and thus needs 12 struts altogether and netting on four sides (i.e. the three vertical faces and the roof). The structure must be in the shape of a cuboid and have dimensions which are whole numbers of metres.



Physical constraints

Throughout this question all your answers must abide by the following three constraints.

- The wall is **15 metres high** and **20 metres long**.
- There is **600 m² of netting** available.
- The **smallest strut which can be used for the framework is 9 metres long**, so none of the dimensions of the cage can be less than this.

Desirable outcome

For part (d) of this question you will also need to consider the following additional outcome.

- For animal welfare reasons the cage should have a volume of **1900 m³** or more.

The final design of the cage will fulfill this desirable outcome, but the process of designing the cage may involve considering dimensions which do not do this.

An example of the dimensions of a cage which could be made from the netting, **but which does not fit the animal welfare consideration**, is given below. Note that the dimension referred to as 'length' is that which is parallel to the wall.

Example

Length: 11 m

Width: 12 m

Height: 13 m

Area of netting required: roof = $12 \times 11 = 132\text{m}^2$
 front = $13 \times 11 = 143\text{m}^2$
 sides = $2 \times (13 \times 12) = 312\text{m}^2$
 TOTAL = 587m^2 (which is within specified limit of netting area)

Volume = $13 \times 12 \times 11 = 1716\text{m}^3$ (which does not satisfy the specified limit of cage volume)

- (a) If a cage with dimensions 10m, 11m and 15m was to be constructed, what is the **smallest total area** of netting that would be needed? [2]
- (b) Consider possible cages which are of the same height as the wall. What is the **maximum length** that the cage can be? Justify your answer. [3]
- (c) What is the **largest volume** cage that can be built with a height of 14 metres? Justify your answer. [3]
- (d) Show that it is possible to fulfil the desired animal welfare outcome of a minimum volume of 1900m^3 . [2]

2 Study the following evidence and answer the questions which follow. Show your working.

The Island of Ferrin is linked to the mainland by a causeway (road). The island becomes cut off from the mainland twice a day as the incoming tide covers the road. It is possible to make accurate predictions of when it is possible to cross the causeway. Crossing times are published well in advance for the benefit of residents and tourists. The table below shows the crossing times for next July. For example, on 1 July the causeway is open from 10:15 to 16:35 and then from 22:05 to 05:00 the following day.

July	CAUSEWAY OPEN		CAUSEWAY OPEN	
	From	To	From	To
1	10:15	16:35	22:05	05:00
2	10:35	17:40	22:30	06:15
3	10:55	18:55	23:05	07:50
4	11:45	20:25		
5	00:10	09:20	13:05	21:45
6	01:40	10:35	14:45	22:50
7	03:15	11:30	16:10	23:35
8	04:40	12:10	17:15	00:15
9	05:45	12:45	18:05	00:45
10	06:35	13:15	18:40	01:15
11	07:10	13:40	19:10	01:50
12	07:40	14:05	19:40	02:25
13	08:05	14:40	20:05	03:00
14	08:25	15:15	20:30	03:40
15	08:45	15:55	20:55	04:25
16	09:05	16:35	21:15	05:10
17	09:25	17:25	21:40	06:05
18	09:55	18:20	22:10	07:10
19	10:35	19:25	22:55	08:20
20	11:40	20:35		
21	00:10	09:30	13:15	21:45
22	01:40	10:30	14:55	22:35
23	03:20	11:15	16:25	23:15
24	04:45	11:50	17:40	23:50
25	06:05	12:20	18:45	00:20
26	07:10	12:55	19:40	01:00
27	08:10	13:35	20:25	01:45
28	07:55	13:25	20:00	01:40
29	08:30	14:20	20:25	02:40
30	08:55	15:15	20:50	03:50
31	09:20	16:25	21:20	05:10

Bus times

The mainland end of the causeway is in the village of Linkham. A local bus service runs from Barwell to Linkham. Upon arrival at Linkham the bus continues on to Ferrin. The causeway must be open for the bus's outbound time and the inbound time at Linkham. For instance, for the first bus of the day to make the crossing, the causeway must be open for the whole of the time between 09:26 and 10:19 (see table below). Here is the Bus Timetable (which operates daily):

Outbound	Barwell (Station)	09:05	10:10	12:10	14:15	15:05	16:15	18:10
	Barwell (High Street)	09:10	10:15	12:15	14:20	15:10	16:20	18:15
	Hayston	09:24	10:29	12:29	14:34	15:24	16:34	18:29
	Linkham	09:26	10:31	12:31	14:36	15:26	16:36	18:31
	Ferrin (Castle) – arrive	09:40	10:45	12:45	14:50	15:40	16:50	18:45
Inbound	Ferrin (Castle) – depart	10:05	11:05	13:05	15:05	15:45	17:05	18:45
	Linkham	10:19	11:19	13:19	15:19	15:59	17:19	18:59
	Hayston	10:21	11:21	13:21	15:21	16:01	17:21	19:01
	Barwell (High Street)	10:35	11:35	13:35	15:35	16:15	17:35	19:15
	Barwell (Station)	10:40	11:40	13:40	15:40	16:20	17:40	19:20

Castle opening times

Ferrin Castle is the Island's main tourist attraction. It opens each day at 09:00 or 30 minutes after the causeway opens (whichever is the later) and closes at 18:00 or 30 minutes before the causeway closes (whichever is the earlier). However, on days when it is not possible to be open for a continuous period of at least three hours it remains closed.

- (a) State the arrival times at the Castle bus stop of all the buses that will continue from Linkham to Ferrin on 24 July. (The bus makes the journey whether or not the Castle is open). [2]
- (b) (i) On 20 July, at what time will the Castle open? [1]
(ii) On 20 July, at what time will the Castle close? [1]
- (c) The first date in July when the Castle will be closed all day is 6 July.
On what date will the Castle next open? Show clearly how you reach your conclusion. [2]
- (d) Barry and Clare will be staying in Barwell from 2 July to 12 July. During their holiday they would like to take the bus to Ferrin. However, they will only do so if they will be able to spend at least five hours exploring the Island, including a visit to the Castle.
On which date(s) would this be possible?
Show all your working, and for each date that is possible state the earliest arrival time at, and the latest departure time from, the Castle bus stop. [4]

3 (a) Provide a brief analysis of the structure of Loh Kang's argument in Document 1: The Myth of Equality. [6]

(b) Give a critical evaluation of Loh Kang's reasoning, assessing any strengths and weaknesses and any implicit assumptions made. [6]

(c) 'Gender equality is possible.'

Commenting critically on some or all of the Documents (1)-(5), and introducing ideas and arguments of your own, construct a well-reasoned case **either** for **or** against the above statement.

You may use examples of gender inequalities from your own country or other countries.

[18]

DOCUMENT 1

The Myth of Equality

Why should women want to be equal to men? Feminists have focused on the inequalities experienced by women. However, they miss an important point. Yes, women have been held back by the social systems which men have constructed. But what would happen if those systems could be made to suddenly disappear as if by magic? What we would find is that women are intrinsically superior to men.

To begin with, women are more able to resolve disagreements in a constructive way. Women are better at hearing and comprehending than men. While men may say that they 'hear' what is being said, this does not mean they go a step further and actually 'listen' (i.e. process and internalize what is being said). Men tend to set out to win an argument, rather than to reach a rational conclusion based on a healthy debate. This highlights a key difference between men and women - men are competitive and women are cooperative. The competitive approach was effective in earlier times of human development (and still is in some narrow spheres such as sport), but the challenges that the world faces in the twenty-first century require a cooperative approach. For example, male leaders have repeatedly failed to resolve conflicts in the world, except by the use of military force.

Women also have other qualities that mark them out as the superior sex. Men may be physically stronger (on average) but women have greater stamina. Women have a greater capacity for withstanding and coping with pain: how many men would have babies if they had to endure the pain of childbirth?

In fact, recent scientific research indicates that soon women will be able to conceive babies without men. This gives added weight to the view that 'a woman needs a man like a fish needs a bicycle'. Hence men are becoming redundant with regard to the continuance of the human race.

It is well-known that women can 'multi-task' - that is they can do several things at the same time, such as making a call on a mobile phone while driving the car and planning the next day's work meeting, all at the same time. Furthermore, women are more flexible and readily adapt to change. Women are good at 'sense making', that is, working out what is happening in unfamiliar circumstances; and then they are pro-active and respond in an appropriate way, rather than procrastinating and/or taking inappropriate action such as being aggressive. All this shows that women can do things much better than men.

History has led to a situation where women have to devote energy to asserting themselves and demanding equal rights, but this obscures the fact that women have innate characteristics that mark them out as better human beings. Nature may have given men an advantage in the recent and distant past, but nature will favour women in tomorrow's world.

Loh Kang

DOCUMENT 2

Emancipation of African Women

Male-authored, male-based history texts have failed to acknowledge women's past contributions to the political life of most African societies. Recently a growing literature has aimed to correct the record by highlighting the important roles African women played as political actors in the pre-colonial period.

Historically, the status of African women was not equal to that of men as patriarchal societies dominated. But this was not the same as what happened to women during colonisation. In pre-colonial times African women wielded substantial economic and political power. Most African women were fully engaged in both reproductive and productive activities. Europeans who colonised Africa transplanted their ideas of male-dominated politics, and ignored African women's political and economic activities, and defined them as dependants of men. Colonial policy ensured that African women were excluded from politics and decision-making in agricultural production, due to Western ideas about the 'proper' place of men and women in societies. Missionary education was primarily geared towards providing the educated men with good wives and home-makers.

One of the ways that African governments today have sought to redress this subordination of African women is through the introduction of affirmative action programmes. For example, in Uganda a 'sex quota' of seats is reserved for women in government. But despite the increase in the number of female politicians in Uganda, it is still extremely difficult for women to achieve emancipation. Female politicians face many challenges including sexual harassment. When women step over from the 'private' sphere to claim their rightful space in the 'public' arena, traditional values provide a ready tool for men to use to remind them of their 'proper' place. Many Ugandan women accept without question such traditional concepts and the stereotypical images painted of women by society. This explains why women themselves are hostile to those women who enter national politics.

Emancipation of African women will depend on public education and awareness-raising as well as transformation of existing political structures.

Sylvia Tamale

DOCUMENT 3

Gender at Source

Two somewhat differing versions by ancient Jewish writers summarise the initial story of creation. The first chapter of the Book of Genesis from the Hebrew scripture, which forms a part of the Christian Old Testament, describes the creation story, of how God in six days created the Earth, and finally a human couple simultaneously. However in the second version of creation in chapter 2, woman is created subsequently from the rib of an already created male. Although more detailed, there is no evidence in the second version that the first ever female, at source of origin, was subordinate, inferior or commanded to be subject to the male. The initial creation story in chapter 1 is as follows:-

Genesis chapter 1:-

v¹. 26: Then God said, 'Let us make adam² in our image, after our likeness. And let them have dominion over the fish of the sea and over the birds of the heavens and over the livestock and over all the earth and over every creeping thing that creeps on earth.'

v. 27: So God created adam in his own image; male and female he created them.

v. 28: And God blessed them. And God said to them, 'Be fruitful and multiply and fill the earth and subdue it and have dominion over the fish of the sea and over the birds of the skies³ and over every living thing that moves on the earth.'

The word 'adam' is the generic⁴ Hebrew term for human being which consists of both males and females. They are given a special role within creation – 'let them have dominion'. This is by virtue of their special relationship to God – they are the bearers of the 'image of God'.

In the account of their creation in Genesis chapter 1, there is no priority given to either sex about the time of their appearance on Earth or their function as human beings on Earth. Their creation occurs simultaneously. Their creative role is described only together, and not as a hierarchy. Neither is given supremacy over the other.

Believers of the biblical creation story will therefore have to guard against errors of interpretation when reading the initial account of the creation story in chapter 1. Such interpretations have come about through the later dominant interpretation of the story by a historically male-dominated society which makes the female the inferior partner.

Brevard S Childs
(Retired Sterling Professor of Divinity, Yale University)

¹ Abbreviation for 'verse'.

² This is translated 'man' usually in many Bible translations of the original Hebrew, without any distinction between the generic (species) term human being (adam) and the specific term, the first ever male human being (Adam).

³ The word in the English translation is 'heavens' which here refers to the 'skies' or 'air'.

⁴ Class or species.

DOCUMENT 4

Pre-modern Western misogyny⁵

Many anatomists of the seventeenth century speculated heavily on the second version of the biblical creation story about the rib from which Eve was created. They decided that of seven ribs in the human anatomy only five were perfectly circular. Many people thought woman was created from one of the imperfect, bent or crooked ribs of the first man. And physical deformity entailed moral imperfection. We find many misogynist writers using this idea to discredit women. Joseph Swetnam who became known as the 'woman-hater' reasoned: 'a rib is a crooked thing good for nothing else, and women are crooked by nature...'⁶ Further in the second version of creation, Eve comes into existence after Adam, and this is significant for understanding the history of misogyny in the West. The historically dominant male interpretation was that since man was created first he had to have priority and therefore woman was inferior. Only rarely were voices raised in the seventeenth century against such interpretations. For instance Margaret Fell the Quaker, declared that God did not 'make such distinctions and discriminations as men did' against women.

John Jonston in 'An History of the Wonderful Things of Nature' stated, 'We all know there are two sexes: the male and the female; and the female is inferior in all things. God gave the man the superiority and commanded the woman to obey... women are easily angry, and as soon as their temper is kindled it boils over'⁷. A hundred years earlier John Knox had ranted against the reign of Queen Elizabeth I and the idea that women should have dominance over men: 'For (in the animal kingdom) nature has printed a certain mark of dominion in the male and a certain subjection in the female, which differentiates them'⁸. Knox would no doubt have been seriously irritated by the discovery that not only the English but the bees also were ruled by a queen.

P C Almond

⁵ Hatred of women.

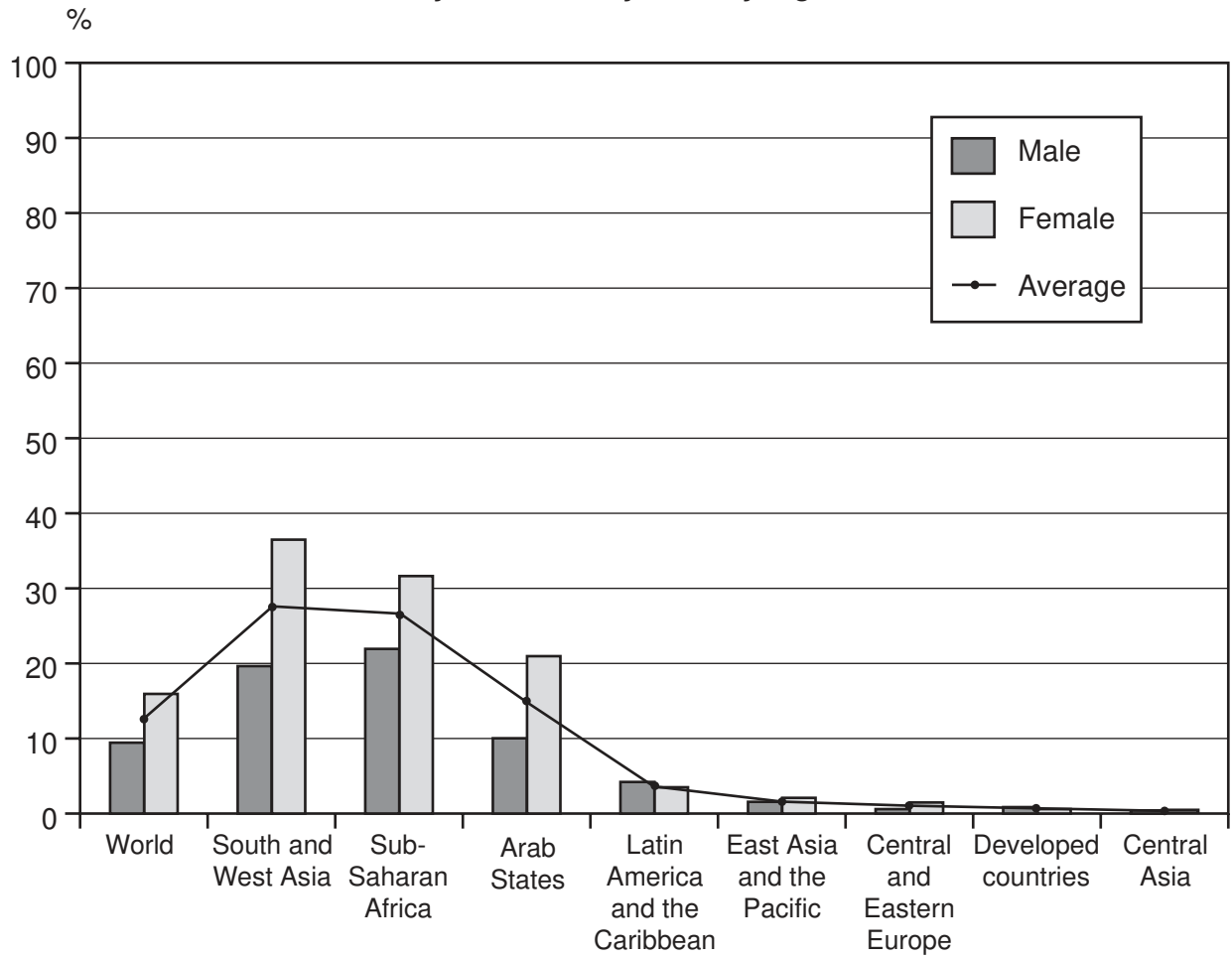
⁶ Joseph Swetnam, *The arraignment of lewede, idle, forward and unconstant women* (London, 1615), p.1.

⁷ John Jonston, p.329, (London 1657); the quote is rephrased for modern readers.

⁸ John Knox, *Trumpet against the monstrous regimen of Women* (Geneva, 1558), rephrased here in modern terms.

DOCUMENT 5

World youth illiteracy rates by region and sex



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