



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Subsidiary Level and Advanced Level

THINKING SKILLS

Paper 4 Applied Reasoning

9694/04

May/June 2008

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 and 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 that follow. Show your working.

Town planners decide how much of a site for a proposed new town is to be set aside for different purposes. They are restricted by the size of the site, the need to provide for the residents and the need to attract residents.

A site that is being considered for development has an area of 30 km².

Simplified model

(1) There must be facilities for providing protection, information & advice, health & welfare, and administration. These are municipal facilities. For this model assume that 0.5 km² is needed per 10 000 people.

(2) There must be areas set aside for essential retail outlets (convenience stores, post offices, clothes shops etc). For these needs assume that 0.25 km² is needed per 10 000 people.

(3) Finally there need to be jobs for the people. Both the municipal and the essential retail areas will provide jobs, but there is likely to be a need for more jobs than this. Jobs which are not servicing the immediate needs of the residents (i.e. municipal and essential retail) will be referred to as 'industrial'.

Provision of jobs

Assume that:

- 1000 jobs will be provided per km² of municipal buildings
- 200 jobs will be provided per km² of essential retail buildings
- 1000 jobs will be provided per km² of industrial buildings.

Assume that 50% of the town's population needs to be working in the municipal/retail/industrial areas. These people form what is called the 'working population'.

Residential buildings

Assume that:

- One km² of residential building will house 500 people on average
- The residential sites are whole km² blocks which cannot be subdivided, and are fully inhabited.

Note: The other building areas can be split into smaller blocks as needed.

Example to show that 5 km² of residential sites can provide for its population in a 30 km² site.

- $5 \times 500 = 2500$ population.
- $0.25 \times 0.5 = 0.125$ km² of municipal building required.
- $0.25 \times 0.25 = 0.0625$ km² of essential retail building required.
- Jobs provided by the municipal and essential retail facilities:
 $(0.125 \times 1000) + (0.0625 \times 200) = 137.5$ employed.
- This would provide jobs for $137.5/2500 = 5.5\%$ of the population.
- 44.5% need to be employed in industrial areas = 1112.5 people.
- This many jobs would be provided by 1.1125 km² of industrial buildings.
- The total required would be $5 + 0.125 + 0.0625 + 1.1125 = 6.3$ km².
- This is well within the 30 km² limit.

- (a) What is the maximum number of people that can be housed, given that municipal and essential retail requirements must be satisfied but ignoring employment needs?
 Show all your working. [3]
- (b) If the population decided upon in part (a) were to be housed:
- (i) Calculate what percentage of the population could be employed by the jobs made available in the municipal and essential retail areas. [1]
- (ii) Calculate how much industrial space would be needed to provide the remainder of the working population with jobs. [1]
- (c) What is the maximum amount of space that can be given up to residential sites (in whole number km²) if the town is to provide the required services and jobs for its population?
 Show your working, and explain how you know your answer is correct. [5]

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

Several mail delivery companies operate in the Republic of Herbania. The Herbania Internal Postal Service (HIPS) is popular (because it is cheaper than the others), but it deals exclusively with mail posted and intended for delivery within Herbania, and does not accept items with a weight of greater than 500 grams.

The postage charged by HIPS depends upon a combination of the weight of an item and its destination.

		Rate			
		A	B	C	D
Weight (up to)	125g	40c	52c	61c	70c
	250g	52c	61c	70c	81c
	375g	56c	65c	77c	86c
	500g	61c	70c	81c	90c

Items delivered within the same province are charged at Rate A. The following table shows the rates that apply when sending mail from one province (e.g. Angelica) to another (e.g. Borage).

C									
C	D								
B	C	D							
C	B	C	C						
D	C	C	D	B					
B	C	B	C	B	C				
B	B	C	B	B	C	B			
C	C	B	D	B	B	B	C		
C	D	B	D	C	D	B	C	C	

HIPS offices sell postage stamps with the following values only:

5 cents, 16 cents, 21 cents, 30 cents, 36 cents, 40 cents and 45 cents.

These were chosen to minimise the number of different stamp values, whilst ensuring that all charges can be achieved with a maximum of three stamps (e.g. 77c = 45c + 16c + 16c).

(a) Write down the names of the provinces from which the maximum HIPS postage is 81 cents. [2]

(b) Basil wishes to send a letter weighing 180g from Sorrel to Fennel.

(i) What is the HIPS postage for this item? [1]

(ii) How can Basil pay this postage with a maximum of three stamps? [1]

(c) Rosemary lives in Chervil, but works in the neighbouring province Sorrel. She has just written 60 party invitations (weighing 90g each) – 24 to addresses in Chervil, 15 to Sorrel, 8 to Hyssop, 8 to Marjoram, 3 to Vervain and 2 to Borage.

By posting some of the invitations in Sorrel, on her way to work, instead of posting them all in Chervil, how much can she save on HIPS postage? [3]

(d) By looking at a maximum of four stamps per item instead of three, HIPS is considering the withdrawal of some of the current stamp values (without introducing new ones).

Show this is possible, indicating clearly which values should be kept.

What is the maximum number of stamp values that can be withdrawn?

You must show how all of the postage charges can now be achieved. [3]

3 Study the following evidence and answer the questions below.

(a) Outline the structure of the argument in Document 1, identifying the reasons and conclusion(s). [4]

(b) Give a critical evaluation of CATT's reasoning in Document 1, commenting on its strengths and/or weaknesses, and any unstated assumptions. [6]

(c) "Tiger farming can save the wild tiger."

Construct an argument **either** for **or** against the above statement by selecting from and critically referring to Documents (1) – (5). Introduce ideas and arguments of your own in support of your case. [20]

DOCUMENT 1**“Stepping up” conservation of the tiger or chasing a market dream?**

China’s President Hu Jintao and India’s Prime Minister Manmohan Singh in a scheduled meeting will be discussing, among other things, upping bilateral trade to \$40 billion a year. Tigers also come in for some high level attention, viz, that “co-operation in wildlife conservation particularly in tiger conservation will be stepped up”. Well, “stepped up” could mean that transboundary law enforcement operations to stop smuggling tiger parts from India into China may be discussed. Alternatively, “stepped up” could mean that China and India will soon shake hands on China opening legal trade in tiger parts, through innovative tiger farming.

Conservation campaigners and other groups are now pressing President Hu to reassure them that China’s 13-year ban on tiger trade remains firmly in place. They warn: “tiger farming will create incentives to poach and opportunities for increased illegal trade in parts and derivatives of wild tigers”.

World Bank economist Richard Damiens explains it this way: “Poaching a tiger is cheap, perhaps \$20 to \$40. But raising a captive tiger to maturity can be at least 150 times more expensive – in the range of \$3000 to \$10 000. Clearly the gap in overheads is so large that no amount of tiger farming can bring the price down to a level that renders poaching unprofitable. Rather it could provide a nice safe place for smugglers to sell the parts of poached tigers”.

Further, tiger farming would re-ignite the demand for tiger products among more than 1 billion increasingly wealthy consumers, many of whom remain convinced of the tonic powers of the tiger-bone wine. This would mean that the 3000 to 5000 tigers left in the wild would end up fighting for their existence.

Jay Mazoomdaar in an Indian Express article has highlighted how some free-market pundits are chasing their market dreams by arguing that domesticating the tiger can help conserve the species. But, according to Jay Mazoomdaar, tiger farming is really only that – a market dream. Or, rather, a marketing dream. Because who really wants tiger products anymore? The use of tiger skins to adorn traditional robes in Asia’s pan-Tibetan region is losing popularity. And the use of tiger-bone in medicines was banned in China in 1993, at which time the traditional Chinese medicine industry moved on to effective alternatives.

Indian pundits are not the only dreamers. Wealthy businessmen in China stand to earn tens of millions of dollars from tiger farming. It is clear that enforcing national and international laws against tiger poaching was not and is not in their best interest. No one will make a penny from saving tigers in the wild. Indeed, if existing laws were being enforced, no one would be proposing the ridiculousness of tiger farms as a conservation tool.

The solution to saving wild tigers is not speed breeding their captive counterparts to resuscitate a market for tiger products that went out of business 13 years ago. The solution to saving wild tigers is to enforce the law. The solution is to enforce existing laws that make tiger poaching a crime. The solution is to enforce current trade bans that make buying, selling and smuggling tiger parts and products a crime.

CATT (Campaign Against Tiger Trafficking)

DOCUMENT 2**Save the Tiger – by Commerce not Conservation**

The idea being promoted is that farming tigers could prevent wild tigers from being hunted into extinction. The New Scientist (18 November 2006, pp 16-17) carries an article in which Barun Mitra, a managing trustee of the Liberty Institute (LI), a free-market think-tank, states that the grounds for farming tigers are sound.

The LI estimates that about 4000 tigers are being reared in a handful of Chinese farms. Since Chinese law forbids the killing of these animals, breeders are supposed to wait until the tigers die of natural causes before selling their parts. Barun Mitra argued, during a talk he gave on 15 November in Washington DC, that commerce not conservation was needed to protect wild tigers. Mitra did not respond to New Scientist's request for an interview, but his views, and the fact that he has closely worked with Chinese businessmen, are well-known.

Worried conservationists point out that China has been banging this drum for some time. Recently a Chinese businessman argued that farming bears for their bile has boosted their numbers in the wild. The UK branch of the World Society for the Protection of Animals, disputes these claims and says that farming animals in this way perpetuates the illegal market. Mitra's belief, however, is that by flooding the market with cheap farmed-tiger products, it will become uneconomic to hunt wild tigers, and millions of dollars can be raised to conserve them.

D. Graham-Rowe

DOCUMENT 3**The Dream of Co-existence – Tiger with us**

Can humans and tigers co-exist? On the principle that they could, Indian policy at one time had been not to interfere with poor rural villages located within crucial tiger habitats. The strategy was adopted as the most cost-effective and ecology-sensitive way: “The habitat must be shared between the people and the tigers, so that both coexist, as they must. The poverty of one will be the destruction of the other.”

But the policy proved short-sighted; the shocking disappearance of tigers from Sariska, a tiger reserve in Rajasthan, forced the government to a serious re-think. A Tiger Task Force was set up by the government to present a national action plan to save the tiger. Overall, the Task Force concluded that the biggest threat to the tiger was not merely poaching but a combination of poaching and the growing discontent of rural people who lived in and around tiger habitats. These people felt they were unfairly prevented from opportunities to improve their impoverished conditions. In the report, “Joining the Dots”, a member of the Task Force gave some reasons to show how impractical the policy of co-existence as a strategy for conservation had turned out to be:-

The scheme of coexistence as conservation was based on a belief that both local people and tigers would benefit by making use of under-utilized forest resources in vast areas of India. However, this did not really lead to tiger conservation, especially when human and cattle populations were constantly rising. Each tiger had to eat 50 cow-sized animals a year to survive. Therefore, if you put a tiger amongst cows and people, the conflict will be eternal and perennial. Tigers continue to lose out as they did in Sariska. The premise of continued co-existence over vast landscapes where tigers survive ecologically, as well as people thrive economically, is an impractical dream. Such dreaming cannot save the tiger; rather it will be a “no win” situation for everyone and result in further declines and the eventual extinction of tiger populations.

Tiger Task Force (TTF) Report

DOCUMENT 4**Tiger heals**

Tiger parts are used in some traditional Asian medicines. Many people in Asia believe that tiger parts have medicinal properties. These beliefs have not been scientifically corroborated. They include:

- The tail of the tiger is sometimes ground and mixed with soap to create an ointment for use in treating skin cancer.
- The bones found in the tip of the tiger's tail are said to ward off evil spirits.
- Crushed tiger bones added to wine serves as a Taiwanese general tonic.
- Tiger's skin is said to cure a fever caused by ghosts. In order to use it effectively, the user must sit on the tiger's skin, but beware: if too much time is spent on the tiger's skin, legend says the user will become a tiger.
- Adding honey to the gallstones and applying the combination to the hands and feet is said to effectively treat abscesses.
- Burnt tiger hair can allegedly drive away centipedes.
- Mixing the brain of a tiger with oil and rubbing the mixture on your body is an alleged cure for both laziness and acne.
- Rolling the eyeballs into pills is an alleged remedy for convulsions.
- If whiskers are kept as a charm, legend says one will be protected against bullets and have increased courage.
- You will allegedly possess courage and shall be protected from sudden fright if you wear a tiger's claw as a piece of jewellery or carry one in your pocket.
- Strength, cunning and courage can allegedly be obtained by consuming a tiger's heart.
- Floating ribs of a tiger are considered a good luck talisman.
- The tiger's penis is said to be an aphrodisiac.
- Small bones in a tiger's feet tied to a child's wrists are said to be a sure cure for convulsions.

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DOCUMENT 5**Tiger numbers**

Q: How many tigers are left in the wild today?

A: There are 4 tiger sub-species still left in the wild:

- Bengal (predominantly in India): about 4000.
- Amur/Siberian (lives in dense and snowy forests in Siberia): about 450.
- Sumatran: about 450.
- Indo-Chinese: between 1100 and 1800. The country with the most (500) is Malaysia, the rest are in Vietnam, Cambodia, Myanmar (Burma) and surrounding countries.

South China Tiger: there may be none in the wild. There are about 60 in captivity in China, all descended from 6 individuals.

The Caspian, Bali and Javan tigers have all become extinct since 1940.

Loss of habitat (tigers prefer natural forests) is as much a threat to tigers as hunting in the past or poaching today.

Posted on a 'question and answer' website by Scavenger on 12 September 2006.

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Document 2 © D. Graham-Rowe; *New Scientist*, 18 November 2006.
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