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**THINKING SKILLS**

**9694/43**

Paper 4 Applied Reasoning

**October/November 2018**

**1 hour 30 minutes**

No Additional Materials are required.

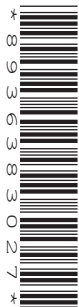
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**READ THESE INSTRUCTIONS FIRST**

An answer booklet is provided inside this question paper. You should follow the instructions on the front cover of the answer booklet. If you need additional answer paper ask the invigilator for a continuation booklet.

Answer **all** the questions.

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



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

- 1 Study the information below and answer the question that follows.

**Following health department advice could save 10 000 lives a year**

Hospitals failing to follow government health department advice about handwashing could mean that many more people than necessary are dying each year, a major new study has found. Capital City Hospital, the biggest in the country and a centre of excellence for major surgery, conducted a study into the effectiveness of hand-sanitisers in preventing patient deaths. Hand-sanitisers were installed at the entrances to 15 of the hospital's 30 wards, with advice to staff and visitors to use the sanitisers when entering or leaving a ward. Over the course of the year the hospital found that 2430 patients died, compared with an average of 2630 over the previous 10 years, a drop of 8%. As 125 000 people die in our hospitals every year, the introduction of hand-sanitisers to all hospitals could save up to 10 000 lives per year.

Make **five** criticisms of the way the study was conducted or any inference drawn from it. [5]

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

- 2 Briefly analyse Mythbuster's argument in Document 1: *Mythical beasts*, by identifying its main conclusion, intermediate conclusions and any counter-assertions. [6]
- 3 Give a critical evaluation of the strength of Mythbuster's argument in Document 1: *Mythical beasts*, by identifying and explaining any flaws, implicit assumptions and other weaknesses. [9]
- 4 'The Yeti is nothing more than a myth.'

Construct a reasoned argument to support **or** challenge this claim, commenting critically on some or all of Documents 1 to 5 and introducing ideas of your own. [30]

## DOCUMENT 1

### Mythical beasts

Wouldn't it be great if monsters existed? The so-called science of cryptozoology is the search for animals whose existence or survival is disputed. Legends of dragons and other creatures, such as Bigfoot and the Yeti, stretch back millennia. One of the most well-known of these is the Loch Ness Monster, whose myth began less than a century ago. However, such legendary creatures neither exist now, nor have they existed in living memory.

Science is constantly discovering new species of animal, but these are all small – frogs, beetles, worms and the like. The Loch Ness Monster is a supposedly dinosaur-like inhabitant of a Scottish lake. People in one of the most technologically-advanced and densely-populated countries in the world have been actively searching for it since a well-publicised 'sighting' in 1933. If it existed, we would have found it by now. A live Loch Ness Monster has never been captured. With modern technology, such as radar and heat-sensing equipment, we could surely find something as large as a bus in a medium-sized lake. Hundreds of whales and other marine animals wash up on beaches all around the globe, but no Loch Ness Monster. Within the last 50 years we have discovered one ocean-going giant, the colossal squid, initially from washed-up specimens but more recently on video.

An important consideration is what any potential monster has been living off all this time. At around 7.5 km<sup>3</sup>, Loch Ness is the biggest lake by volume in Great Britain but, in the grand scheme of things, Loch Ness is not that big. Many seemingly monster-free lakes around the world are much bigger and the oceans are bigger still. Let's say, hypothetically, that the Loch Ness Monster is real: there would have to be more than one and, to be sustainable, there would have to be a population of around 20. So there cannot be enough fish in Loch Ness for them to eat.

All the photographs that allegedly show the Loch Ness Monster are obvious fakes or blurry, or can easily be given a more mundane explanation, and all of the eyewitness testimony is weak. There is a distinct lack of hard evidence for the monster. Much like eyewitness evidence of aliens in the USA, the witnesses tend to be lone individuals, late at night and often under the influence of alcohol. Aliens do not exist and neither does the Loch Ness Monster.

Without the myth of the Monster the community around Loch Ness in the north of Scotland would have to survive on a modest income from farming, fishing and forestry. With the legend in place, we are talking about a lucrative industry. Coach loads of tourists keep hotel and tour operators busy all year round. The film industry, from Hollywood fiction to TV documentaries, pours millions of dollars into the local economy. Most of the eyewitness accounts are tainted because they come from people living in the very area that benefits most from tourist spending. The real reason all these mythical beast stories persist is money.

### Mythbuster

## DOCUMENT 2

### A brief history of the Yeti

The Yeti is believed to be an ape-like creature, taller than a human, that lives in the Himalaya mountains. The Yeti has various names and has been a part of the beliefs and legends of several local peoples for centuries. The word Yeti is derived from the Tibetan *yachê*, meaning 'rock bear'. Because of the lack of conclusive evidence, scientists have generally regarded the Yeti as a myth, yet it remains one of the most famous creatures of cryptozoology.

Stories of the Yeti began to receive worldwide attention when Westerners began exploring the Himalayas in the mid-19th Century. In 1832, an expedition in northern Nepal reported spotting a "tall, two-legged creature covered with long dark hair". The expedition leader concluded it was an orangutan. Since then many expeditions have actively sought evidence of the Yeti and reports of sightings, footprints and other signs have emerged on a regular basis. Here are just a few:

- In 1925, a photographer and member of the Royal Geographical Society wrote about seeing a creature at a distance of 250 yards for about a minute. The creature was "in outline exactly like a human being, walking upright and stopping occasionally to pull at some dwarf rhododendron bushes. It showed up dark against the snow, and as far as I could make out, wore no clothes." Later, the photographer saw prints, described as "similar in shape to those of a man, but only six to seven inches (15–18 cm) long by four inches (10 cm) wide".
- A 1951 Everest expedition photographed some large footprints in the snow. Some argue these photographs are strong evidence of the Yeti's existence, while others suggest the prints are those of an unremarkable creature distorted by the melting snow.
- In 1953, Sir Edmund Hillary and Tenzing Norgay reported seeing large footprints while scaling Everest. Tenzing wrote in his first autobiography that he believed the Yeti was a large ape and, although he had never seen one, his father had seen it twice. By the time of his second autobiography he had become much more sceptical.
- The Daily Mail Snowman Expedition of 1954 photographed many footprints in the snow. Most of these were identifiable but there were many which were not. The *Daily Mail* subsequently printed an article which described expedition teams obtaining hair specimens from an alleged Yeti scalp. The hairs were black to dark brown in colour in dim light, and fox red in sunlight. The hair was analysed by Professor Frederic Wood Jones, an expert in human and comparative anatomy. Jones was unable to identify the animal from which the hairs were taken. Later analysis of a similar 'Yeti scalp' from a different location suggested that the specimen was from a type of Himalayan antelope known as a *serow*.

In 1959, the US government thought that finding the Yeti was a likely enough prospect to create rules for American 'Yeti' expeditions. One such expedition brought back supposed Yeti faeces, which were found to contain a parasite which could not be identified. Since parasites tend to be specific to a particular host, this evidence suggests that the animal that produced the faeces is also unknown to science.

## DOCUMENT 3

### Science proves Yeti is real

A scientist from Oxford University has published the world's first well-supported DNA evidence that the Himalayan Yeti exists.

The DNA sequences from two hair samples found in remote regions of the Himalayas show a 100% match to the DNA sequences of a prehistoric creature, resembling a polar bear, that lived in the Pleistocene period.

The discovery suggests that these bears, not seen for 40 000 years, might roam the mountain still. It has been suggested by cryptozoologists that this might well be the biological foundation of the Yeti legend.

Prof Sykes is writing a book about the link between the samples and the 40 000-year-old bear fossil remains entitled *The Yeti Enigma*, and said a Himalayan expedition was "the next logical step". "We need a live Yeti", he said. His team's study was published in the respected peer-reviewed journal *Proceedings of the Royal Society*.

The study invited people from around the world to send in hair samples for testing. His team then analysed 36 specimens, reported by those who sent in the specimens to be either Yeti or other large 'cryptoprimates' – Bigfoot (US), *almasty* (Russia) or *orang pendek* (Sumatra). Most of the samples proved to be from familiar, modern species – horses, cows, bears, dogs and even one unidentified human. But a sample of golden-brown hair from a specimen shot in the northern Indian region of Ladakh in the 1980s and a redder-brown sample from Bhutan both matched the Pleistocene bear.

Prof Sykes and his team wrote: "It seems more likely that the two hairs are from either a previously unrecognised bear species or colour variants of *Ursus maritimus* (polar bear), or *Ursus arctos* (grizzly bear) / *Ursus maritimus* hybrids." It is possible that the specimens were descended from an ancient cross-breeding between polar bears and grizzly bears soon after the evolutionary paths of the two species diverged.

### Newspaper report from 2015

## DOCUMENT 4

### Some stories from Bhutan

Until relatively recently it was not unusual for people in the Himalayan kingdom of Bhutan to report encounters with the *migoi*, a legendary creature which is similar to the Yeti. But with the arrival of electricity and other features of the modern world, it is no longer necessary for villagers to climb high into the mountains searching for firewood or pasture on which to graze yaks and goats. It is at these high altitudes where traces of the *migoi* were often seen. The three reports below are from elderly Bhutanese people:

- “Many people who have seen the *migoi* say that it walks upright but cannot bend its body. This is why traditional Bhutanese homes have small doorways – so anyone entering needs to bow their heads.”
- “I was about nine years old and had gone high up in the mountains to collect dry leaves for the cattle. That was soon after a heavy snowfall, which lasted for almost nine nights. The *migoi* must have come down, trying to escape the snow. I just saw the footprints the *migoi* left behind. I ran nearly all the way home. When I returned home, my parents were quite disappointed to see me empty-handed. I explained that I saw the footprints of the *migoi*, which were very fresh, as if it had walked past in the morning. I told them I was very scared. When I described the footprints to my father, he explained to me that *migoi*’s feet are pointed towards the back, unlike the feet of humans.”
- “The *migoi* is a very large two-legged creature, as big as one and a half, or sometimes two yaks. It has hair like a monkey except on its face. The female has breasts that sag. They are usually encountered alone or as couples but rarely in groups. They communicate with each other by whistling and they emit a foul smell. On occasions they grin menacingly and make strange noises; they even indulge in mimicry. It is generally agreed that encountering them is a bad omen, which leads to misfortune and even death.”

Although eyewitness accounts such as these might not convince everybody, let’s not forget that people in the West refused to believe Chinese stories about the giant panda until 1869, when a French missionary received a skin from a hunter.

### Extract from a magazine article

**DOCUMENT 5****Some§ species of megafauna (large animals) discovered since 1900**

Okapi\*\*\* 1901 – a long-necked herbivore with features of a giraffe, zebra and antelope  
 Mountain gorilla\* 1902  
 Giant forest hog\* 1904  
 Komodo dragon\*\*\* 1910 – the world's largest lizard  
 Mountain anoa\* 1910 – a type of small Indonesian buffalo  
 Mountain nyala\* 1910 – a type of east African antelope  
 Colossal squid\*\*\* 1925  
 Bonobo\* 1928 – a species of chimpanzee with more human-like features than related chimpanzees  
 Kouprey\* 1937 – a bovine species native to south-east Asia  
 Coelacanth\*\* 1938 – a large fish with muscular fins believed extinct for 65 million years  
 Hoan Kiem turtle\*\*\* 1967  
 Chacoan peccary\*\* 1975  
 Megamouth shark\* 1976  
 Saola ox\* 1992  
 Giant muntjac deer\* 1994  
 Bigfin squid\* 1998  
 Unnamed species of hammerhead shark\* (2004)  
 Burchell's zebra\*\* 2004  
 Grizzly–polar bear hybrid 2006 – discovered in Canada as a result of natural cross-breeding  
 Clouded leopard\* – 2007  
 Myanmar snub-nosed monkey\* 2010  
 Kabomani tapir\* 2013  
 Araguaian river dolphin\* 2014

\* Previously unknown

\*\* Believed extinct

\*\*\* Initially believed to be fictitious or a hoax

§ The list is not complete. For example, many ocean-dwelling species have been omitted for the sake of space.

**Page from a website for people interested in cryptozoology**

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