READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13** which are based on Reading Passage 1 below.

The Invention of Television

The question "Who invented television?" is simple enough, but the answer is surprisingly controversial. No one person was responsible for producing what we think of as television today and the credit is due to various inventors.

The Scotsman, John Logie Baird, is considered by many to be the inventor of television. He showed early signs of his inventing ingenuity by setting up a telephone exchange to connect his house to those of his friends near by. His first interest in television came in 1903, after he read a German book on the photoelectric properties of selenium. In 1873, this element was discovered to have the capacity to generate a current based on the amount of light applied to it. Working initially in Hastings, England, Baird famously created an apparatus using an old hatbox he bought in a used goods store, a pair of scissors, some needles, some bicycle light lenses and an old tea chest. Baird also used a Nipkow disk, created by German inventor, Paul Nipkow, and a lot of his work was based on the previous work by German, Arthur Korn. In February 1924, Baird demonstrated moving silhouette images on a 'television'. Later that year, after nearly destroying the house and nearly killing himself with an electric shock, Baird moved to London, where he gave the first public display of his invention. On 2 October 1925, Baird used an office assistant, William Taynton, to move for his transmitted pictures, and Taynton became the first person to be televised moving and in full tonal range. Baird is also later credited with demonstrating the first images on colour television, on 3rd July 1928, although the credit for being the inventor of colour television is again disputed. Another first for Baird was transmitting the first television pictures across the Atlantic in 1928. Although Baird was well known for his invention, he also became famous for refusing an offer of £100,000 for the shares in his company, which was an enormous sum at that time. Baird famously said that he would not be able to sleep at night, knowing he had that much money.

Philo Farnsworth successfully demonstrated electronic television in San Francisco, in 1927, using a different system. Farnsworth realised that a picture could be dissected by a simple television camera into a series of lines of electricity. The lines would be transmitted so quickly that the eyes would merge the lines. Then, an image dissector, which Farnsworth created, would change those lines back into a picture. The Russian inventor, Vladimir Zworykin, built on this work and it was Zworykin's designs that were eventually used by the BBC in the UK to replace Baird's system.

LIVEWORKSHEETS

Baird's initial work would not have been successful without the previous work of Paul Nipkow. Nipkow came up with the idea of 'scanning' a television image by using a spinning disk with a spiral of small pinholes. When spun at a high rate of speed, each hole would allow light to fall on a selenium cell on the other side of the disk. The amount of voltage the cell generated would depend on the amount of light reflected from the object being photographed. One rotation of the disk equalled one frame of "video". At the place where the signal was received, the process would be reversed. A similar disk spun in sync and a neon lamp reacted to the changes in voltage with the speed required to keep up with the spinning disk and projected the images onto a screen. Although Nipkow created the disk and acquired a patent for his invention, he did not create the apparatus to project images. The patent expired after 15 years, as no one was interested then in the work. Baird's first practical television systems used an electro-mechanical picture scanning method, the method that Nipkow had helped create with his disk. Nipkow became a celebrated scientist in Germany for his work, but the mechanical nature of the Nipkow Disk caused the invention to fade to obscurity with the use of the cathode ray tube.

Arthur Korn was another German scientist working in the same field as Baird and Nipkow and it was his work that allowed the development of Nipkow's work that in turn led to Baird's breakthroughs. Korn's early work was focused on the transmission of visual telegraphic transmission, using his developments in amplification tube technology. He sent a picture of the German Crown Prince 1800 kilometres in 1906 and sent a picture of the Pope across the Atlantic in 1923. Korn's work was celebrated and, from 1928, the German police used his technology to send photographs and fingerprints.

Finally, another American, Charles Francis Jenkins, has a claim to be the inventor of television. Jenkins, who at the time was very well known for inventing the motion picture projector, first transmitted a silhouette picture from one room to another in 1922. Jenkins founded a broadcasting company in 1928, but the crash of 1929 forced him out of business. Most people agree that Baird gave his first public demonstration of television a couple years earlier than Jenkins, but this is disputed in some places.

It is plain to see why any claim to be the inventor of television is said to be controversial. In many cases, the answer to the question, "Who invented television?", often just depends on from which country the person answering the question is.

Questions 1-7

LIVEWORKSHEETS

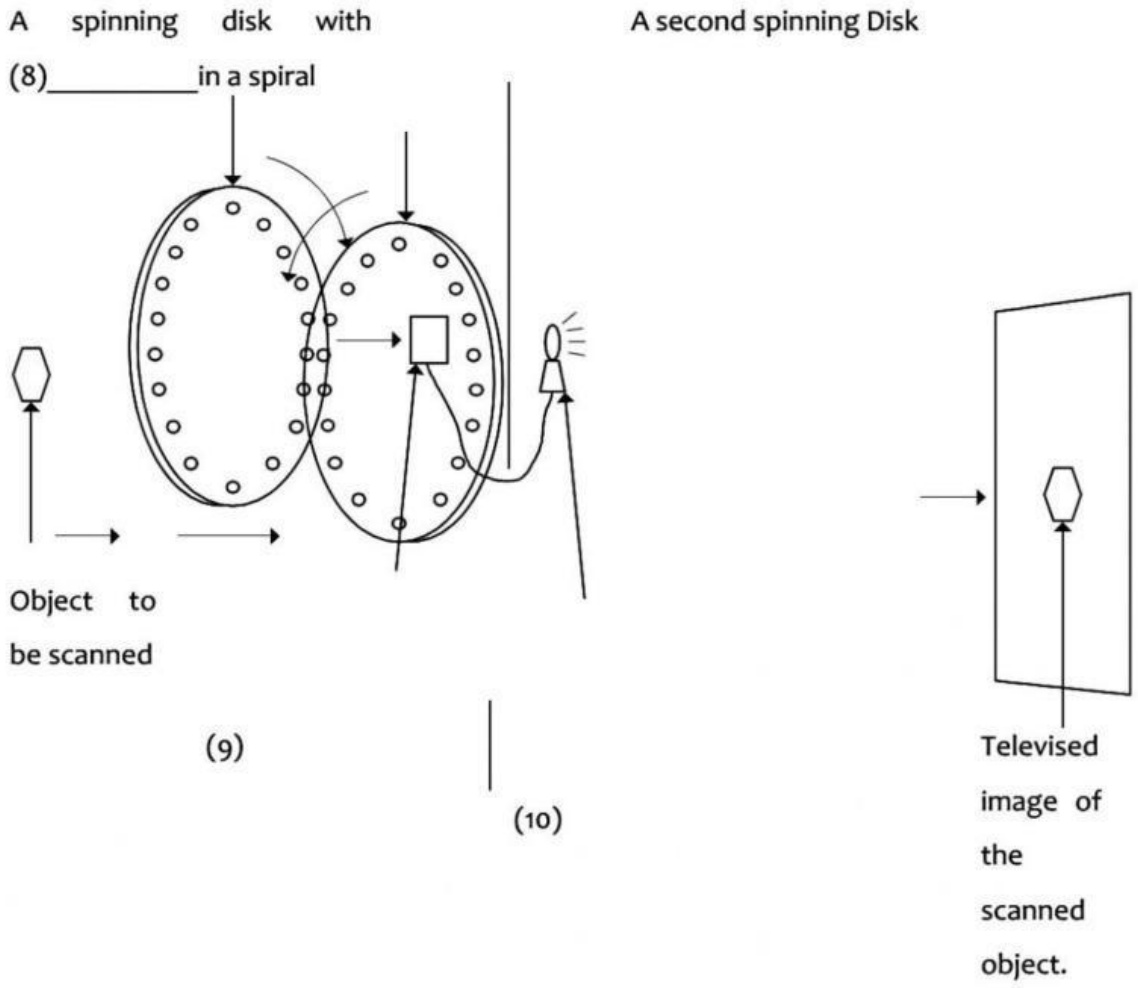
Look at the different significant people in the process of the invention of the television
(questions **1 – 7**) and match them to their roles in this process (**A – G**).
*Write your answers in boxes **1-7** on your answer sheet.*

The Significant Person	Roles
1 John Logie Baird	**A** His work was adopted by the BBC for their broadcasting business.
2 William Taynton	**B** His work was used to help fight crime.
3 Philo Farnsworth	**C** He was the first person to move on television.
4 Vladimir Zworykin	**D** He used second hand parts in his invention.
5 Paul Nipkow	**E** His business was destroyed by a financial crisis
6 Arthur Korn	**F** He invented the image dissector.
7 Charles Francis Jenkins	**G** His work was initially of no interest to anyone.

Questions 8 -10
Label the diagram below.
Write **NO MORE THAN THREE WORDS** from the text for each answer.
*Write your answers in boxes **8-10** on your answer sheet.*

Transmitting an Image using a Nipkow Disk

LIVEWORKSHEETS



Questions 11-13

Do the following statements agree with the information given in the text?

*In boxes **11-13** on your answer sheet write:*

TRUE if the statement agrees with the information

FALSE if the statement contradicts the information

NOT GIVEN if there is no information on this

11 Nipkow died without any of his work being widely recognized.

12 Korn and Nipkow often met to discuss their work.

13 Charles Francis Jenkins was already famous when he experimented with television.

READING PASSAGE 2

You should spend about 20 minutes on **Questions 14-26** which are based on Reading Passage 2 below.

LIVEWORKSHEETS

Bluefin Tuna

Three species of bluefin tuna are found around the world – Northern or Atlantic bluefin tuna, Southern bluefin tuna and Pacific bluefin tuna. Atlantic bluefin tuna is divided into two stocks. The western stock is harvested off the coast of North America by Canada, Japan, and the United States, and the eastern stock is harvested off the coast of Europe and Africa and in the Mediterranean Sea.
Fisheries for bluefin tuna date back thousands of years in the Mediterranean, but did not emerge in the western Atlantic until the 1950's. Although today they are widely known as the most prized species of tuna, there was no commercial market for western Atlantic bluefin tuna until then. In fact, fishermen regarded giant bluefin tuna as a nuisance because of the damage they caused to fishing gear. However, as sushi and sashimi markets in Japan developed in the 1970's and 1980's, the demand and prices for bluefin tuna increased and so did fishing pressure around the world.
Since bluefin tuna are late to mature, slow growing, and long-lived, they are especially susceptible to fishing pressure, compared to faster growing, more productive species. Bluefin tuna grow more slowly than other tunas and have a long life span, up to 20 years or more, and generally do not spawn until they are about eight years old. Because many nations harvest bluefin tuna, effective conservation and management of this resource depend on strong international cooperation. The United States has taken many steps to conserve and manage US fisheries for Atlantic bluefin tuna since the early 1980's. It is due in part to these measures and US efforts internationally that Atlantic bluefin tuna are no longer subject to overfishing.
Today, international fisheries for western Atlantic bluefin tuna are highly regulated. The most recent annual catch level set is expected to support continued growth and recovery of the stock. Strict controls are in place to ensure compliance, on the water, in port, and at the marketplace, through the implementation of the catch documentation scheme, which allows trade tracking for individual shipments of fish.
Finally, because the western and eastern stocks mix, western Atlantic bluefin tuna are also affected by the fishing pressure in the eastern Atlantic that took place in the eastern Atlantic/ Mediterranean during the 1990's and early 2000's. However, in recent years, catches in the eastern Atlantic have been reduced to levels consistent with scientific advice, and new monitoring and control measures have been adopted to address illegal, unreported and unregulated fishing on that stock. Scientists advise that improved stock conservation in the eastern Atlantic would likely benefit the western stock as well.

LIVEWORKSHEETS

The news is not so good for bluefin tuna in other parts of the world. Data recently released shows that there is almost no more bluefin tuna to be fished in some of the oldest fishing grounds, especially in the West Mediterranean. Around Spain's Balearic Islands, catches of bluefin tuna are down to only 15 per cent of what they were just a decade ago. In Australia, there is a similar story and the southern bluefin tuna stock is at historically low levels, with less than 10 per cent of the virgin stock left, and little significant progress in preventing the overharvesting that is driving the species further towards extinction.

Because of the value of bluefin tuna, scientists are trying to work out ways of farming the species. The vision is to have huge tanks, land-based, having bluefin tuna that are spawning year-round on demand, producing millions of eggs. These eggs would hatch and grow into a plentiful supply of tuna. There are, however, problems associated with rearing bluefin tuna. First of all, the larvae that hatch from the eggs are extremely fragile. Because of their heavy heads, the larvae tend to go downwards. If they hit the bottom of a tank, the shock is too much and they do not survive. After this, a significant problem is the appetite of the bluefin tuna. A bluefin tuna's natural diet consists of lots of other fish. Just supplying the amount of fish needed for bluefin tuna to grow would be difficult and expensive, without even considering the harm to the environment of taking that many wild feed fish from the sea. Right now, there are tuna ranches that capture young tuna in the ocean and then fatten them up in big net-pens. These ranches feed their tuna about 15 pounds of fish, such as sardines or mackerel for each additional pound of tuna that can be sold to consumers. This kind of tuna production is environmentally costly. Some scientists have theorised that it will be possible to reduce this ratio or even create tuna feed that does not rely so heavily on other fish as an ingredient. The effect on the taste of the bluefin tuna's flesh though may make the product less valuable and destroy the whole point of producing bluefin tuna cheaply.

Other experts say that these problems show that bluefin tuna farming is not the path to follow, as farming bluefin tuna just increases the population of a predator species that demands lots of food itself. It might do more good to eat a little lower on the marine food chain. People could eat more mussels or sardines and let more tuna roam free to be sustainably caught within quota systems and premium-priced.

Questions 14-16

Complete each sentence with the correct ending (**A – E**) below.

*Write the correct letter (**A – E**) in answer boxes **14-16** on your answer sheet.*

14 Bluefin tuna were not widely fished for outside the Mediterranean in the 1940's, because

15 Fishermen in the past did not want to catch bluefin tuna, because

LIVEWORKSHEETS

16 Bluefin tuna are extremely vulnerable to over-fishing, because

A they take a long time to grow to adulthood.
B the fish damaged their equipment.
C the fish are not found in freshwater.
D the fish were suspected to cause various types of cancer.
E there was no significant market for them.

Questions 17-21

Complete the sentences below.
Write **NO MORE THAN THREE WORDS AND/OR A NUMBER** from the text for each answer.

*Write your answers in boxes **17-21** on your answer sheet.*

17 ..... between the relevant countries will be needed if bluefin tuna resources are to be managed in a sustainable fashion.

18 Any caught bluefin tuna can be tracked in North America due to the use of the .....

19 ..... in the eastern stocks has affected the numbers of the western Atlantic bluefin tuna.

20 Bluefin tuna catches are down to ..... of what they were previously near the Balearic Islands.

21 ..... is a real danger due to the overharvesting of the southern bluefin tuna.

Questions 22-26

Complete the summary using the words in the box below.
*Write your answers in boxes **22-26** on your answer sheet.*

FARMING BLUEFIN TUNA

Scientists are working on how to develop large-scale bluefin tuna farms to rear them from egg to adult, with fish **22**..... all year. Obstacles are the **23**..... of bluefin larvae, which means they die easily, and the amount of fish needed to feed them until they reach harvest size. Some operating farms capture **24**..... to feed up, but this too is environmentally damaging.
One solution is that a non-fish based feed can be used, but this may affect the product's taste. It could be that bluefin tuna are not meant to be farmed and that people should eat fewer **25**..... fish and allow the bluefin tuna to become a **26**..... meal.

eggs	**fragility**
protecting	**strength**
sea	**reproducing**
luxury	**juveniles**

LIVEWORKSHEETS

simple **predatory**

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40** which are based on Reading Passage 3 below.

Children and Playing

Paragraph A

Childhood is in every sense a preparation for adulthood, both in terms of physical and mental maturation. It is an essential stepping stone that allows all young people to adjust optimally to the requirements that collective expectations and rules set for any adult individual, to both integrate, exploit and enjoy living within society. By definition, individuals who fail to meet these criteria are classified as anti-social or in some way incapable of coping with societal expectations and therefore unlikely to experience a positive quality of life. Aspects of human brain maturation continue from birth until into the late teens. During this long developmental period, a child will learn from interactions with parents, siblings, relations, peers and teachers, and will have both positive and negative emotional experiences due to these and other life events. Not only is this a phase of intense adaptation and information gathering, but the process of maturation is organised so as to structure it progressively in the most effective way. Of course, a child is strongly influenced by being taught by other individuals, but each child also has at their disposal a highly effective, self-help tuition kit that is present for all children. This is play.

Paragraph B

Play is a fundamental behaviour of juveniles in all species of birds and mammals. While adults can also show it, although at a much-reduced frequency, they often give the impression that it is an attractive, but wasteful expression of leisure that only the young with minimal responsibilities can indulge in. In truth, it is this play of youth that prepares an individual in an important variety of ways for adulthood. While the building blocks for brain development are created before birth, the brain is only about 25 per cent complete at birth. The brain maturation process continues during the first two decades of life, although of course, brain networks can continue to adapt in the light of experience throughout the whole of an individual's life. The types of play that humans exhibit change during the various maturational stages of the brain.

Paragraph C

Between birth and year one, play during this period involves practice of the movement and sensory systems with interest in patterns, colours and sounds,

LIVEWORKSHEETS

exploring textures, grasping objects and performing simple actions with them. Play is highly repetitive, like a form of practice. Over the next two years or so, examples of pretend play are seen, indicating that individuals are capable of symbolic thought. The brain's specialised language production and comprehension regions develop, as language communication expands rapidly. Language is also played with in rhymes and songs and 'silly' sounds, and pretend characters can talk, express emotions and perform actions. Between ages three and eight, play becomes more elaborate and extensive. Children engage in complex theme play involving roles, scripts and costumes. By the age of six, games with rules become a pervasive play activity, as well as rule negotiations and discussion of "fairness". Both co-operation and competition occur in these games, as well as in spontaneously invented ones. Through this kind of play, children demonstrate extensive symbolic thought capacities and the ability to self-regulate and explain their own behaviour. From ages eight to fourteen, play becomes increasingly sophisticated and symbolic, with pretend themes often carrying on for months. Symbolic board and computer games are also popular. At this stage, many children will have been introduced to adult-controlled more organised games, such as sport, which require greater control of motor, social and cognitive processes.

Paragraph D

While young animals of most species show mainly relatively simple forms of play up to the age of puberty, it is notable that the species that tend to have the most complex life styles engage in play the most and with the most sophisticated repertoire. This naturally includes non-human primates and particularly the great apes, where quite complex forms of social and object play are seen. Dolphins are also notable in the range and complexity of the games they play. It has been claimed that captive bottle nosed dolphins can show 317 distinct forms of play behaviour. One of these is blowing bubbles and catching them in the mouth before they reach the surface. To add interest and competition, they can apparently make the task more and more difficult by releasing the bubbles closer and closer to the surface or modifying swimming style while the bubbles are released.

Paragraph E

Amongst mammals other than humans, it is the species that rely on their group hunting skills that show the greatest amount of play behaviour as juveniles. Hunting species also seem happy to play with objects, presumably because they represent practice for catching and manipulating prey. Apart from developing sensorimotor dexterity, these play interactions also help to sort out dominance relationships and promote social alliances and cohesion in the group, though not with outsiders to the group. Play for all species is a key adaptive tool for survival

LIVEWORKSHEETS

and therefore, like all-important behaviour, its expression is linked to brain dopamine reward systems.

Paragraph F

Play deprivation can have a significant effect in humans. Children who have been deprived of play are likely to have been neglected in many other ways. The effects can include an inability to make friends and socialise, leading to an isolated childhood and adolescence, which in turn can lead to a lonely and isolated adulthood, with individuals unable to understand their own or other's emotions. A childhood without adequate play experiences can lead to a lack of physical skills and abilities, which often leads to obesity and poor health, and a lack of confidence in one's own abilities.

Questions 27-34

The text on the previous pages has 6 paragraphs **A – F**.

Which paragraph contains the following information?

*Write your answers in boxes **27-34** on your answer sheet.*

27 The earliest forms of human play are often very repetitive.

28 Some animals consciously like making their play games more challenging.

29 A newborn baby's brain is only about a quarter developed.

30 Children will often start to engage in role-playing after the age of three.

31 Children who miss out on adequate play can experience emotional problems.

32 People who fail to adapt to social expectations of behavior can be seen as being anti-social.

33 The animals that have the most complex lives also have the more complex play routines.

34 Animals that hunt like to play with objects.

Questions 35-39

Choose the correct letter **A**, **B**, **C** or **D**.

*Write the correct letter in boxes **35-39** on your answer sheet.*

35 Children's interaction with parents is

A initially better experienced with both parents present.

B not always a positive experience.

C never to be avoided.

D always a positive experience.

36 Adults often display that

A play is a waste of time for them.

B play is still an everyday part of their lives.

C play is something to do with their children.

D play is something that should be done with increased frequency.

LIVEWORKSHEETS

37 When children first start to play games with rules,

A they develop the ability to cheat.

B they develop the ability to plan ahead.

C they develop the ability to justify their actions.

D they develop the ability to choose teams.

38 Play routines for hunting animals do not help them

A develop the ability to chase prey.

B develop social relationships with animals outside their group.

C develop social relationships within their group.

D develop coordination.

39 Children deprived of play are liable to

A be entrepreneurs.

B have older siblings.

C be smaller.

D have often suffered some form of neglect.

Question 40

Choose the correct letter, **A**, **B**, **C** or **D**.

*Write the correct letter in box **40** on your answer sheet.*

40 What is the writer's purpose in Reading Passage 3?

A To explain the problems faced by children who do not experience enough play.

B To analyse the different types of play games experienced by humans and animals.

C To assess the role and importance of play in humans and animals.

D To discuss the role of the child psychiatrist in recommending different play games for children.

LIVEWORKSHEETS