IELTS ACADEMIC · READING PASSAGE 2 · QUESTIONS 1–14 · SUGGESTED TIME: 20 MINUTES

READING PASSAGE 2

The Machine from the Sea

How a corroded lump of bronze rewrote the history of technology

A In the spring of 1901, sponge divers sheltering from a storm near the small Greek island of Antikythera came upon the wreck of an ancient ship, its remains scattered with bronze and marble statues that had lain on the seabed for some two thousand years. Among the treasures hauled to the surface was an unremarkable corroded lump of bronze, easily the least impressive object recovered — and, as it would slowly emerge over the following century, by far the most extraordinary. Today that object, the Antikythera mechanism, is widely described as the earliest known analogue computer: a geared machine that modelled the movements of the heavens with a precision that would not be matched again for a very long time.

B In its complete form the mechanism was a hand-cranked box of interlocking bronze gears, no larger than a thick book. It now survives in 82 fragments, of which only about a third of the original remains, including some thirty corroded gearwheels. By turning a handle on its side, a user could set the device to a chosen date, whereupon its dials would display the positions of the Sun and the Moon together with a range of related astronomical information. What makes it so startling is not merely its ingenuity but its isolation: nothing of comparable mechanical complexity is known to have been built anywhere for more than a thousand years afterwards.

C For the first half-century after its recovery, the device gave up few of its secrets. Too fragile and too thoroughly corroded to be prised open without destroying it, it sat in a museum as an intriguing curiosity. The first real progress came in the mid-twentieth century, when the British physicist-turned-historian Derek de Solla Price passed beams of radiation through the fragments and, from the shadowy outlines of the gears within, argued that the object had been an astronomical calculating machine. His study, published in 1974, established the broad purpose of the device, though much about how it actually worked remained obscure.

D The decisive advance came in 2005, when a research team brought to Athens a purpose-built X-ray machine capable of imaging the interior of the fragments in three dimensions at extremely fine resolution. The machine had originally been designed not for archaeology but to inspect industrial components for hidden flaws. Its scans exposed thousands of minuscule Greek characters inscribed on surfaces buried within the corrosion — in effect an instruction manual etched into the bronze, describing the dials and the celestial motions they were built to represent.

E The reconstructed picture is remarkable. On the front, a pointer tracked the Sun’s path around a ring marked with the zodiac, while a second showed the Moon advancing not at a steady pace but at its true, uneven rate — an effect achieved by a brilliant pairing of gears in which a pin on one disc ran along a slot in another. A small ball, one half dark and one half light, turned to indicate the lunar phase. On the back lay two great spiral dials: one followed a nineteen-year cycle that reconciled the lunar months with the solar year, while the other traced an eighteen-year cycle by which eclipses could be predicted, with engraved symbols marking the months in which an eclipse was due and even its likely time and colour.

F The mechanism was not concerned only with the abstract heavens. A subsidiary dial tracked the four-year cycle of the great Panhellenic athletic festivals, among them the Olympic Games, tying the motions of the sky to the rhythms of civic and religious life. The level of skill embodied in such gearing — above all in the device that captured the Moon’s changing speed — implies a mature tradition of mechanical craftsmanship. Yet that is

precisely the puzzle: of such a tradition almost nothing else survives, and the expertise the mechanism represents seems to appear in the record only to vanish from it again.

G Work on the device continues to this day. A reconstruction published in 2021 proposed how the front display might also have shown the five planets known to antiquity, and scholars still debate finer points, such as how the calendar ring around the front was divided. Whatever remains unresolved, the mechanism has already overturned a comfortable assumption: that the Greeks excelled at abstract theory but had little taste or talent for practical engineering. It stands instead as proof that a civilisation two thousand years ago could capture the order of the cosmos in turning bronze — and then, somehow, let that knowledge slip away.

TRUE / FALSE / NOT GIVEN

Questions 1–5. *Do the following statements agree with the information given in Reading Passage 2? Tick (✓) one box for each statement.*

1. Only part of the original mechanism has survived to the present day.

☐ TRUE ☐ FALSE ☐ NOT GIVEN

2. The device could be opened and examined easily soon after it was discovered.

☐ TRUE ☐ FALSE ☐ NOT GIVEN

3. The Greek inscriptions found inside the device explained the functions of its dials.

☐ TRUE ☐ FALSE ☐ NOT GIVEN

4. The name of the person who made the mechanism is recorded on the device itself.

☐ TRUE ☐ FALSE ☐ NOT GIVEN

5. Devices of similar complexity were produced regularly in the centuries immediately after it was made.

☐ TRUE ☐ FALSE ☐ NOT GIVEN

MULTIPLE CHOICE

Questions 6–9. *Choose the correct letter,* ***A****,* ***B****,* ***C*** *or* ***D****.*

6. What did Derek de Solla Price contribute to the study of the mechanism?

- **A** He recovered the device from the seabed in 1901
- **B** He used radiation to study the internal gears and argued it was an astronomical calculator
- **C** He built a complete working replica of the device
- **D** He deciphered all of the inscriptions hidden inside it

7. Why was the X-ray machine used in 2005 originally built?

- **A** To scan archaeological artefacts at high resolution
- **B** To inspect industrial components for hidden flaws
- **C** To produce medical images of patients
- **D** To survey the seabed where the wreck lay

8. How did the mechanism represent the movement of the Moon across the sky?

- **A** By advancing the Moon pointer at a constant, even speed
- **B** By using a two-coloured ball to mark approaching eclipses
- **C** By using a pin-and-slot arrangement to reproduce the Moon’s varying speed
- **D** By tracking the four-year cycle of the athletic games

9. What does the passage suggest is the most puzzling aspect of the mechanism?

- **A** That it was found on a Roman rather than a Greek ship
- **B** That the engineering skill it required seems to have left almost no other trace
- **C** That its inscriptions were written in Greek
- **D** That it was used to time athletic competitions

SENTENCE COMPLETION

Questions 10–11. *Complete the sentences below. Choose* ***NO MORE THAN TWO WORDS*** *from the passage for each answer.*

10. Today the Antikythera mechanism is widely described as the earliest known _____.

11. On the front of the device, a small two-coloured ball turned to indicate the _____.

MATCHING INFORMATION

Questions 12–14. *The reading passage has seven paragraphs,* ***A–G****. Which paragraph contains the following information? Write the correct letter,* ***A–G****.*

12. A reference to the long period during which no equally complex device is known to have been made.

_____

13. A description of how hidden text was revealed inside the corroded fragments. _____

14. A reference to the device being used to track the timing of athletic festivals. _____

ANSWER KEY

For teacher / self-study use. Fold or detach before distributing to students.

Q	ANSWER	PARA	EXPLANATION
1	**TRUE**	**B**	It survives in 82 fragments, only about a third of the original.
2	**FALSE**	**C**	It was too fragile and corroded to be opened without destroying it, and gave up few secrets for decades.
3	**TRUE**	**D**	The inscriptions acted as an instruction manual describing the dials and the motions they showed.
4	**NOT GIVEN**	**—**	The passage never names a maker or says a name is recorded on the device. (A tempting assumption.)
5	**FALSE**	**B**	Nothing of comparable complexity is known for more than a thousand years afterwards.
6	**B**	**C**	Price used radiation and argued it was an astronomical calculator. Deciphering the inscriptions (D) came later.
7	**B**	**D**	The scanner was built to inspect industrial components, not for archaeology. A is its adapted use, not its origin.
8	**C**	**E**	A pin-and-slot pairing reproduced the Moon’s uneven rate. A is the opposite; B is the phase ball.
9	**B**	**F**	The skill implies a tradition of which almost nothing else survives.
10	**analogue computer**	**A**	“the earliest known analogue computer”.
11	**lunar phase**	**E**	“turned to indicate the lunar phase”.
12	**B**	**B**	The gap of more than a thousand years before any comparable device.
13	**D**	**D**	High-resolution scanning revealed the hidden inscriptions.
14	**F**	**F**	The subsidiary dial tracking the four-year cycle of the games.

APPROXIMATE IELTS BAND EQUIVALENCE (14 QUESTIONS)

SCORE	14	13	12	11	10–9	8–7	6–5	≤4
BAND	9.0	8.5	8.0	7.5	7.0–6.5	6.0–5.5	5.0	<5.0