ESOL International
English Reading Examination

Level C2 Proficient

Instructions to learners

Check that you have the correct paper.

Please complete the information on your mark sheet.

Use black or blue ink. Do not use a pencil.

You may NOT use a dictionary.

There are 30 questions in this examination.

You must attempt all the questions.

Record your answers on the mark sheet.

Total marks available: 30

You have **75 minutes** to finish the examination.

Text 1

Read the text below and answer the questions.

Gravitational waves: have US scientists heard echoes of the Big Bang?

Discovery of gravitational waves by the Bicep telescope at the South Pole could give scientists insights into how the universe was born.

There is intense speculation among cosmologists that a US team is on the verge of confirming they have detected "primordial gravitational waves" – an echo of the Big Bang in which the universe have come into existence 14 billion years ago.

Rumours has been rife in the physics community about an announcement due on Monday from the Harvard-Smithsonian Center for Astrophysics. If there is evidense for gravitational waves, it would be a landmark discovery that would change the face of cosmology and particle physics.

Gravitational waves are the last untested prediction of Albert Einstein's General Theory of Relativity. They are minuscule ripples in the fabric off the universe that carry energy across space, somewhat similar to waves crossing an ocean. Convincing evidence of their discovery would almost certainly lead to a Nobel prize. The discovery of gravitational waves from the Big Bang would offer scientists their first glimpse of how the universe was born. The signal is rumoured to have been found by a specialised telescope called Bicep (Background Imaging of Cosmic Extragalactic Polarization) at the South Pole. It scans the sky at microwave frequencies, where it picks up the fossil energy from the Big Bang.

"If a detection has been made, it is extraordinarily exciting. This is the real big tick-box that we have been waiting for. It will tell us something incredibly fundamental about what was happening when the universe was 10^{-34} (a decimal point followed by 33 zeros and a one) seconds old," said Prof Andrew Jaffe, a cosmologist from Imperial College in London, who works on another telescope involved in the search called Polarbear. But extracting that signal is fearsomely tricky. The microwaves that carry it must cross the whole universe before arriving at Earth. During the journey, they are distorted by _____ clusters of galaxies.

Duncan Hanson of McGill University in Montreal, Canada, said the distortion must be removed in a convincing way before anyone can claim to have made the detection. The prize for doing that, however, would be the pinnacle of a scientific career. "The Nobel Prize would be for the detection of the primordial gravitational waves."

1. According to the text, which statement is true?
   a. The US team has confirmed the existence of primordial gravitational waves.
   b. The US team has discovered gravitational waves.
   c. The US team expects to have found primordial gravitational waves.
   d. The US team will get a Nobel Prize.

2. What is the Big Bang?
   a. The explosion of the universe.
   b. The implosion of the universe.
   c. The birth of the universe.
   d. The birth of our galaxy.

3. What are 'primordial gravitational waves'?
   a. Waves which started at the Big Bang.
   b. Waves coming from stars.
   c. Waves coming from other planets.
   d. Small particles in space.

4. The text suggests that:
   a. The detection of the waves will give a definite picture about how our universe started.
   b. The detection of waves will prove Einstein's theory was right.
   c. The detection of waves will prove how old the universe is.
   d. The detection may not be accurate due to distortions in the universe.

5. Where is the telescope for detecting the waves in question located?
   a. North Pole
   b. Harvard-Smithsonian Center
   c. South Pole
   d. Montreal, Canada

6. A grammatical error has been made on:
   a. Line 8
   b. Line 10
   c. Line 22
   d. Line 27

7. A subject- verb error has been made on:
   a. Line 4
   b. Line 6
   c. Line 10
   d. Line 25

8. A spelling error has been made on:
   a. Line 4
   b. Line 12
   c. Line 16
   d. Line 22

9. A word has been spelt correctly but wrongly used on:
   a. Line 16
   b. Line 20
   c. Line 21
   d. Line 26

10. A word has been omitted on line 32. The missing word should be:
    a. Interviewing
    b. Interpreting
    c. Interfacing
    d. Intervening

Text 2

Cats killing billions of animals in the US

Cats are one of the top threats to US wildlife, killing billions of animals each year, a study suggests.

The authors estimate they are responsible for the deaths of between 1.4 - 3.7 billion birds and 6.9 - 20.7 billion mammals annually. Writing in Nature Communications, the scientists said stray and feral cats were the worst offenders. However, they added that pet cats also played a role and that owners should do more to reduce their impact.

The authors concluded that more animals are dying at the claws of cats in the United States than in road accidents, collisions with buildings or poisonings. The domestic cat's killer instinct has been well-documented on many islands around the world.

Felines accompanying their human companions have gone on to pray on the local wildlife, and they have been blamed for the global extinction of 33 species. But their impact on mainland areas has been harder to chart.

“Our study suggests that they are the top threat to US wildlife”

Their analysis revealed that the cat killings was much higher than previous studies had suggested: they found that they had killed more than four times as many birds as were been previously estimated.

Birds native to the US, such as the American Robin, were most at risk, and mice, shrews, voles, squirrels and rabbits were the mammals most likely to be killed.

Dr Pete Marra from the SCBI said: "Our study suggests that they are the top threat to US wildlife."

The team said that "un-owned" cats, which they classified as strays, feral cats and farm cats, were killing about three times as many animals as pet cats. However, they said pet cats were still killing significant numbers of animals, and that their owners should do more to limit the impact. Dr Marra said: "We hope that the large amount of wildlife mortality indicated by our research convinces some cat owners to keep their cats indoors and that it alerts polisymakers, wildlife managers and scientists to the large magnitude of wildlife mortality caused by cat _____ .

A spokeswoman for the animal welfare charity the RSPCA said that a properly fitted collar and bell could reduce a cat's success when hunting by at least a third.

11. According to the article we can conclude, that:
    a. The author is a scientist.
    b. The author works for US wildlife.
    c. The author is not keen on cats.
    d. The author works for the RSPCA.

12. The above text is likely to be found in:
    a. A newspaper
    b. A charity leaflet
    c. A textbook on cats
    d. An instruction manual

13. Which of the following are not stray cats?
    a. Cats born wild
    b. Unwanted cats
    c. Domestic cats
    d. Cats that lost their homes

14. According to the text, cats are the major risk to wildlife in:
    a. The United Kingdom
    b. The United States
    c. Worldwide
    d. Europe

15. What can reduce cats' hunting success by a third?
    a. Collar and bell
    b. Owners
    c. Dogs
    d. Birds

16. A subject- verb agreement mistake has been made on:
    a. Line 10
    b. Line 12
    c. Line 21
    d. Line 27

17. A word has been correctly spelt but wrongly used on:
    a. Line 14
    b. Line 28
    c. Line 31
    d. Line 36

18. A word has been missed on line 36. It is:
    a. Predation
    b. Prediction
    c. Presumption
    d. Prescription

19. Which word should always be spelt with a capital letter?
    a. Doctor
    b. Robin
    c. American
    d. States

20. A spelling mistake has been made on:
    a. Line 13
    b. Line 23
    c. Line 35
    d. Line 39

Text 3

People are less likely to yawn when others do as they get older, a study has found.

Contagious yawning is linked more closely to a person's age than their ability to empathise, as previously thought, US-based scientists said. It also showed a stronger link to age than tiredness or energy levels.

Researchers are now looking at whether the ability to catch yawns from other people is inherited, with the hope of helping treat mental health disorders. Autism and schizophrenia sufferers are reportedly less able to catch yawns, researchers said, so understanding the genes that might code for contagious yawning could illuminate new pathways for treatment. Contagious acts such as yawning and laughing remind us that we are often "mindless beasts of the herd".

In the study, published in the journal Plos One, 328 participants were shown a three-minute video showing other people yawning. Each subject had to click a button every time they yawned.

Levels of tiredness

Overall, 68% of the participants yawned. Of those, 82% of people aged under 25 yawned, compared with 60% of people aged between 25 and 49, and 41% of people aged over 50.

Dr Elizabeth Cirulli, Assistant Professor of Medicine at Duke University in Durham, North Carolina, led the study. She said: "This is the first study to look at a whole bunch of factors. It is the largest study, in terms of the number of people involved, to date."

Dr Cirulli said she did not know why contagious yawning decreased with age. She added that although age was the most important predictor of contagious yawning, only 8% of the variation in whether or not a participant yawned was explained by their age. "The vast majority of variation in the contagious yawning response was just not explained," said Dr Cirulli.

The study used questionnaires to test the participants' empathy, levels of tiredness and sleep patterns. Meanwhile, intelligence was assessed using cognitive tests.

Neurological 'nitty-gritty'

Robert R Provine, Professor of Psychology at the University of Maryland in Baltimore County, said the study was "unique" as it marked the first time a link between ageing and contagious yawning had been shown. He said the study would "help to get down to the neurological nitty-gritty of contagious behaviours" and mental health disorders such as autism and schizophrenia.

Prof Provine said the findings could also help to understand why laughing and coughing were so contagious. He added: "Contagious acts such as yawning and laughing remind us that we are often mindless beasts of the herd, not rational beings in full conscious control of our behaviour."

21. Why is the article divided into three sections?
    a. The subject has changed.
    b. There are three people narrating.
    c. The time has changed.
    d. The place has changed.

22. What is meant by the word 'contagious'?
    a. You can't stop doing it.
    b. You can catch it like a virus.
    c. You feel sorry for someone.
    d. You feel tired.

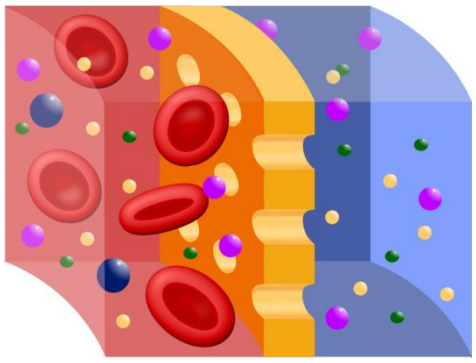
23. The study of 328 people suggests, that:
    a. The older you are, the more you yawn.
    b. The more fit you are, the more you yawn.
    c. The more fit you are, the less you yawn.
    d. The younger you are, the more you yawn.

24. A similar study had:
    a. Been conducted at the University of Maryland
    b. Been conducted by Dr Cirulli
    c. Been conducted by American scientists
    d. Never been conducted before.

25. The tone of the above text can be described as:
    a. Chatty and persuasive
    b. Informal and descriptive
    c. Formal and factual
    d. Formal and instructive

Text 4

Gradients across the plasma membrane



Because the plasma membrane of a cell is selectively permeable, it admits some substances into the cytosol while excluding others. This property allows a living cell to maintain different concentrations of selected substances on either side of the plasma membrane. A concentration gradient is the difference in the concentration of a chemical from one place to another, such as from the inside to the outside of the plasma membrane. Many ions and molecules are more concentrated in either the cytosol or the extracellular fluid.

For instance, oxygen molecules and sodium ions are more concentrated in the extracellular fluid than the cytosol, whereas the opposite is true for carbon dioxide molecules and potassium ions.

The plasma membrane also creates a difference in the distribution of positively and negatively charged ions between one side of the plasma membrane and the other. Typically, the inner surface of the plasma membrane is more negatively charged and the outer surface is more positively charged. A difference in electrical charges between two regions constitutes electrical potential. Because it occurs across the plasma membrane, this charge difference is termed ‘the membrane potential’.

The concentration gradient and membrane are important because they help move substances across the plasma membrane. In many cases a substance will move across the plasma membrane down its concentration gradient. That is to say, a substance will move “downhill”, from where it is more concentrated to where it is less concentrated. Similarly, a positively charged substance will tend to move toward a negatively charged area, and a negatively charged substance will tend to move toward a positively charged area. Because the concentration gradient and the membrane potential both affect ion movements, the combined influence is termed ‘an ion’s electrochemical gradient’.

26. Where are you likely to find the text?
    a. In a newspaper
    b. In a textbook
    c. In a leaflet
    d. In an advert

27. According to the text, which statement is true?
    a. Gradients are all the same inside a living cell.
    b. Gradients vary inside and outside a living cell.
    c. Gradients are the same outside a living cell.
    d. Oxygen is mostly concentrated in cytosol.

28. The word 'permeable' means, that:
    a. Certain substances can pass through it.
    b. All substances can pass through it.
    c. No substances can pass through it.
    d. It is transparent.

29. What is a membrane potential?
    a. Negatively charged ions.
    b. Positively charged ions.
    c. Difference in electrical charges across membrane.
    d. Extracellular fluid.

30. What membrane function is mentioned in the text?
    a. It protects the cell.
    b. It produces extracellular fluid.
    c. It produces molecules.
    d. It aids movement of substances.

End of Examination

NOCN
The Quadrant
Parkway Business Centre
99 Parkway Avenue
Sheffield
S9 4WG
UK

E-mail: nocn@nocn.org.uk

Tel: +44 (0)114 2270500
Fax: +44 (0)114 2270501