

VARC

Read the passage below and answer the questions that follow:

Mushrooms on a log may each seem like quiet, standalone organisms. Still, they're actually the aboveground, sporing fruit belonging to a fungus, connected to the large organism by a root network called mycelium. Although fungi may not seem very talkative either, a new study shows electric signals travelling through their mycelium network could help the organism communicate.

A research paper concludes that some fungi use electrical impulses to share and process information internally. When signal activity spikes, it creates intricate patterns that may function like words in human speech. It is estimated that the fungi vocabulary could consist of about 50 words.

Previous research has found fungi can send electrical impulses underground through long, thread-like structures called hyphae, which expand to form a network of mycelium. Hyphae sort of work like nerve cells, transmitting signals to other parts of the human body. Some studies have shown electrical activity increases when the hyphae of wood-digesting fungi touch wooden blocks, which may indicate fungi use these impulses to share information about food or injury, per the Guardian. In the new study, four fungi species—ghost fungi, caterpillar fungi, split gill fungi, and enoki fungi—were analyzed. Study author Andrew Adamatzky, a computer scientist, eavesdropped on the fungi's chit-chat using tiny electrodes connected to hyphae to measure spikes in signal activity.

Each spike in activity was organized into groups and given a linguistic and information complexity analysis. Spikes varied in duration and length, with some impulses lasting up to 21 hours. The clusters of electrical points resembled a human vocabulary of up to 50 words. However, only 15 to 20 fungal words are used frequently. Fungal words are also similar in length to human words. 'A fungal word length averaged over four species is 5.97, which is of the same range as an average word length in some human languages, e.g. 4.8 in English and 6 in Russian,' Adamatzky writes in the paper. In terms of complexity, split-gill mushrooms produced 'remarkably diverse' sentences, according to the study. While the research shows fungi produce patterns of electric signals, there's no way to tell what they are talking about, if they are at all, per Science Alert.

'We do not know if there is a direct relationship between spiking patterns in fungi and human speech,' Adamatzky told the Guardian. 'Possibly not. On the other hand, there are many similarities in information processing in living substrates of different classes, families, and species. I was just curious to compare.' Like howling wolves, the fungi could be signalling their presence to one another. They could also be saying nothing, but the

spiking events are not random. While comparing the mushroom's electrical impulses to human speech is interesting and notable, some researchers are skeptical. Mycologist Dan Bebber, who was not involved with the study, thinks that the electric signals could be similar to nutrient pulses seen in other fungi. 'Though interesting, the interpretation as language seems somewhat overenthusiastic, and would require far more research and testing of critical hypotheses before we see 'Fungus' on Google Translate,' states Bebber.

1. All of the following statements can be inferred from the passage EXCEPT that:

- A. Fungi communicate similarly to humans when they transmit electrical signals.
- B. A fungal word length is about the same as the average word length in some human languages.
- C. The fungal vocabulary consists of approximately 50 words.
- D. Of the four fungi species, the split gill mushrooms have the most complex sentences.

2. All of the following arguments are made in the passage EXCEPT that:

- A. The electrical spikes of fungi vary in length and duration.
- B. Comparing the mushroom's electrical impulses to human speech is somewhat premature.
- C. There are many similarities in information processing in living substrates of different classes, families, and species.
- D. Mushrooms and fungi are two separate organisms.

3. In which of the following scenarios would the fungi's behaviour probably demonstrate a form of communication?

- I. Electric signals travelling through their mycelium network.
 - II. Electrical impulses on the surface through long, thread-like structures called hyphae, which expand to form a network of mycelium.
 - III. Spikes in signal activity that create intricate patterns resembling human speech.
- A. A and B only
 - B. A and C only
 - C. B and C only
 - D. C only

4. Which of the following can be inferred about the skepticism expressed by Dan Bebber?

- A. He completely rejects the idea that fungi produce any electrical signals.
- B. He agrees that fungal spikes represent a structured form of communication.
- C. He believes the study's interpretation is premature and requires further testing.

D. He believes fungi can use their electrical spikes to form actual sentences.

5. *The four sentences (labelled 1, 2, 3 and 4) given below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer.*

1. Accompanied by Rajput rebels, Sanga defeated invading armies and obtained control of Malwa.
2. After ascending to the throne, Rana Sanga strengthened his position in Mewar and began his struggles against the invading Muslims.
3. The Rajput dynasty was well-known for its brave warriors and its powerful hold on its territories in the Indian subcontinent.
4. During the 16th century, the Rajput dynasty challenged all the non-Indian Muslim dynasties of India.

6. *There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.*

Sentence: We are thus fated to forever live our lives, Kierkegaard tells us, with incomplete information and understanding.

Paragraph: We are constantly moving forward in time. ____ (1) ____ . At no point do we get breathing space to pause and understand reality; it continuously unfolds before us. ____ (2) ____ . The present is a constant stream of becoming that, when we try to hold it in place with our clumsy descriptions, ideas, and concepts, slips through our fingers. ____ (3) ____ . No matter what we want to happen, we cannot ever know what will happen, nor hope to immediately grasp it when it does. ____ (4) ____ . Our future lives may be split into various possibilities in our imaginations, but we can only ever live one of them.

- A. Option 1
- B. Option 2
- C. Option 3
- D. Option 4

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7. *Five jumbled-up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.*

1. Meanwhile, photographs of the bonhomie between Mr Modi, Mr Xi and Russian President Vladimir Putin evoked memories of an inactive Russia-India-China (RIC) trilateral.
2. It has been seven years since Mr Modi travelled to China, and his meeting with Chinese President Xi Jinping was their first such bilateral engagement since the military standoff of 2020.
3. This allowed Mr Modi and his delegation, for the moment, to side-step some of the concerns India has had over China's actions, including its

support to Pakistan during Operation Sindoor and hold off on designating Pakistan-based terrorists.

4. More than the outcomes, Prime Minister Narendra Modi's decision to visit China for the Shanghai Cooperation Organisation (SCO) Summit was a clear message from the government on a shift in its foreign policy outlook.

5. It has been three years since Mr Modi attended the SCO summit, a Eurasian grouping seen as decidedly anti-Western.

8. The four sentences (labelled 1, 2, 3 and 4) given below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer.

1. The concession could be a reduced sentence, a lesser charge, dropping some charges, or any other agreement that benefits the defendant.

2. Plea bargaining is also seen as a way to ensure that the defendant receives a fair and appropriate sentence for their offense, while avoiding the risks and uncertainties of a trial.

3. Plea bargaining is a process in which a defendant in a criminal case agrees to plead guilty to a lesser charge or to a reduced sentence in exchange for some concession from the prosecutor or the court.

4. Plea bargaining aims to resolve a criminal case without going to trial, thereby saving time, resources, and expenses for both the prosecution and the defendant.

9. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Hot and tired, the wait was agonising.

Paragraph: The other day, I was driving with my family for a short vacation, and we hit traffic. ____ (1) _____. My GPS told me that the slowdown would last only 10 minutes, but the cars were barely moving. ____ (2) _____. I looked ahead for the end of the tailback and wished that I could somehow fast-forward to that point. ____ (3) _____. Yet later that same day, once at our destination, I knew that time would start to fly by. ____ (4) _____. Now I wished to slow life down, to squeeze more out of the precious moments to come.

A. Option 1

B. Option 2

C. Option 3

D. Option 4

10. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

A belief or theory is true, for the pragmatists, to the extent that it practically helps us solve problems or allows us to usefully continue our research. That's what we mean when we say it's true that the vaccines

are effective. There's no practical purpose to be served by a metaphysical theory or a gnostic formula beset by obscurity and circularity. Pragmatism says that truth is not the sort of thing one should expect to have a philosophically interesting theory about.

A. Pragmatists do not believe that a philosophical theory or a complex formula that is difficult to understand serves any purpose.

B. Pragmatists believe that truth cannot be explained by any abstruse metaphysical theory.

C. Pragmatists believe in the practicality of a theory rather than in its difficulty or complexity

D. Pragmatists are of the view that the truth should be easy-to-understand and transparent.



DILR

A blue line metro started running from Noida Sector 15 to its destination Noida Sector 62. There were three intermediate stations i.e. Sector 18, Sector 34, and Sector 52 between Sector 15 and Sector 62 in the given order and the fare between any two consecutive stations was Rs. 10.

- The ratio of the number of passengers who boarded and left the metro at Sector 18 was 9:7.
- The number of tickets sold for Sector 62 at Sector 34 was 28, and the total number of Rs. 10 tickets sold at Sector 34 was 42.
- The total number of passengers who boarded at Sector 15 was 456.
- The ratio of the revenue from selling tickets for Sector 52 at Sector 15 and Sector 34 was 30:7.
- The total number of passengers who left the metro at Sector 62 was 348 and the revenue generated by selling tickets for Sector 62 was 11160.
- The total revenue from selling tickets at Sector 52 was Rs. 500.
- The ratio of the total number of passengers who left the metro at Sector 18 and Sector 34 was 7:6.
- The total revenue generated by selling Rs. 20 tickets at station Sector 15 was Rs. 1120.

11. *How many passengers travelled to Sector 52?*

- A. 152
- B. 140
- C. 134
- D. 156

12. *What is the revenue from the travellers boarding the metro at Sector 18?*

- A. Rs. 3520
- B. Rs. 3660
- C. Rs. 3240
- D. Rs. 3950

13. *How many passengers took a Rs. 20 ticket?*

- A. 170
- B. 120
- C. 130
- D. 150

14. *What is the revenue from the sale of Rs. 40 tickets?*

- A. Rs. 7200
- B. Rs. 9000
- C. Rs. 8400
- D. Rs. 8000

15. How many passengers travelled to Sector 62 from Sector 18?

The government withdrew the Rs. 2000 notes from circulation. Five members of the Sharma family, Mukesh, Nita, Akash, Isha, and Anant, deposited some notes in the banks over a period of five months. The following facts are also known:

- The number of notes deposited in a month by a person was always less than 10.
- No person deposited the same number of notes for more than two months.
- In each of the five months, there were fewer notes deposited by Anant than by Akash.
- The number of notes deposited in a month by a person was less than or equal to the number of notes deposited in the previous month.
- The number of notes deposited in June, July, August, and September form an arithmetic progression.
- Nita deposited an even number of notes, while Isha deposited a prime number of notes every month.
- A total of 30 notes were deposited by the family in May.
- The least number of notes deposited in a month by Nita was 2, and this happened only once.
- The numbers of notes deposited by Mukesh every month are five consecutive numbers.
- The total number of notes deposited by Mukesh, Nita, Akash, Isha, and Anant over the five months was 15, 24, 21, 22, and 14, respectively.

16. During which two months did Isha deposit the same number of notes?

- A. May and June
- B. June and July
- C. July and August
- D. None

17. What was the total amount deposited in June?

- A. Rs. 40000
- B. Rs. 45000
- C. Rs. 48000
- D. Rs. 50000

18. Which of these pairs of persons deposited an equal number of notes in August?

- A. Nita and Akash
- B. Mukesh and Isha
- C. Nita and Anant
- D. Akash and Isha

19. How many notes did Akash deposit in May?

20. What was the total amount deposited (in Rs.) by Nita and Isha altogether in July?



QA

21. If the roots of the equation $ax^2 + bx + c$ are such that one root is the square of the other, and $\frac{a-b}{c-b} = \frac{\sqrt[3]{3}}{6}$, find the value of $\frac{c}{a}$.

- A. 36
- B. 54
- C. 72
- D. 108

22. A shopkeeper marked up the price of an item by 27.27%. After giving two successive discounts of 18.18% and $x\%$, he calculated that there is no profit and no loss. Find the value of x .

- A. 3.27%
- B. 2.75%
- C. 5.25%
- D. 3.97%

23. Let p and q be positive integers such that $\frac{16}{37} < \frac{p}{q} < \frac{7}{16}$. What is the smallest possible value of q ?

24. Amar plans to invest in a savings account that pays interest at an annual rate of 12% compounded annually. What amount is the minimum that Amar will need to invest (to the closest 1000) to earn over Rs. 40000 in interest within 4 years?

- A. 65000
- B. 68000
- C. 70000
- D. 72000

25. If $2 \leq a, b \leq 2025$, find the number of elements in the set:
 $\log_a b + 6 \log_b a = 5$

- A. 54
- B. 55
- C. 56
- D. 57

26. If two circles with radii 8 cm and 10 cm touch each other internally, find the length of the longest chord to the outer circle, which is a tangent to the inner circle.

- A. 12 cm
- B. 20 cm
- C. 18 cm
- D. 16 cm

27. In a 500-metre race, if Rani gives Seema a head start of 30 metres, she beats her by 20 seconds. If she gives her a head start of 30 seconds, she beats her by 20 metres. Find Seema's speed in m/s.

- A. 1
- B. 1.5
- C. 2
- D. 2.5

28. Find the sum of the series: $\frac{2}{5} + \frac{6}{25} + \frac{10}{125} + \frac{14}{625} + \dots$

- A. $\frac{2}{3}$
- B. $\frac{3}{4}$
- C. $\frac{4}{5}$
- D. $\frac{3}{5}$

29. The labour earnings in the first week of November were Rs. 1000, Rs. 1050, Rs. x , Rs. 900, Rs. y , Rs. 890, and Rs. 950, respectively, from Monday to Sunday. The average earnings from Monday to Friday is Rs. 1024, and that from Wednesday to Sunday is Rs. 982. Find the average earnings for the week.

- A. 994.3
- B. 1000
- C. 984.6
- D. Cannot be determined

30. In a triangle ABC, let E be the midpoint of AC and F be the midpoint of AB. The medians BE and CF intersect at G. Let Y and Z be the midpoints of BE and CF, respectively. If the area of triangle ABC is 480, find the area (in sq units) of triangle GYZ.

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