

**VARC**

*Read the passage below and answer the questions that follow:*

What causes a helix in nature to appear with either a dextral (right-handed, or clockwise) twist or a sinistral (left-handed, or counterclockwise) twist is one of the most intriguing puzzles in the science of form. Most spiral-shaped snail species are predominantly dextral. But at one time, handedness (twist direction of the shell) was equally distributed within some snail species that have become predominantly dextral or, in a few species, predominantly sinistral. What mechanisms control handedness and keep left-handedness rare?

It would seem unlikely that evolution should discriminate against sinistral snails if sinistral and dextral snails are exact mirror images, for any disadvantage that a sinistral twist in itself could confer on its possessor is almost inconceivable. But left- and right-handed snails are not actually true mirror images of one another. Their shapes are noticeably different. Sinistral rarity might, then, be a consequence of possible disadvantages conferred by these other concomitant structural features. In addition, perhaps left- and right-handed snails cannot mate with each other, having incompatible twist directions. Presumably an individual of the rarer form would have relative difficulty in finding a mate of the same hand, thus keeping the rare form rare or creating geographically separated right- and left-handed populations.

But this evolutionary mechanism combining dissymmetry, anatomy, and chance does not provide an adequate explanation of why right-handedness should have become predominant. It does not explain, for example, why the infrequent unions between snails of opposing hands produce fewer offspring of the rarer than the commoner form in species where each parent contributes equally to handedness. Nor does it explain why, in a species where one parent determines handedness, a brood is not exclusively right- or left-handed when the offspring would have the same genetic predisposition. In the European pond snail *Lymnaea peregra*, a predominantly dextral species whose handedness is maternally determined, a brood might be expected to be exclusively right- or left-handed—and this often occurs. However, some broods possess a few snails of the opposing hand, and in predominantly sinistral broods, the incidence of dextrality is surprisingly high.

Here, the evolutionary theory must defer to a theory based on an explicit developmental mechanism that can favor either right- or left-handedness. In the case of *Lymnaea peregra*, studies indicate that a dextral gene is expressed during egg formation; i.e., before egg fertilization, the gene produces a protein, found in the cytoplasm of the egg, that controls the pattern of cell division and thus handedness. In experiments, an injection

of cytoplasm from dextral eggs changes the pattern of sinistral eggs, but an injection from sinistral eggs does not influence dextral eggs. One explanation for the differing effects is that all *Lymnaea peregra* eggs begin left-handed but most switch to being right-handed. Thus the path to a solution to the puzzle of handedness in all snails appears to be as twisted as the helix itself.

*1. The author would most likely agree that the predominance of dextral snails would be an even greater scientific puzzle if which of the following were true?*

- A. The incidence of dextrality in predominantly sinistral broods was found to be zero
- B. Sinistral and dextral snails were found to be exact and true mirror images of one another.
- C. The "dextral gene" was found to be a recessive, rather than dominant, trait.
- D. The structural differences between left- and right-handed snails were found to be even more noticeable than currently observed.

*2. The author's discussion of *Lymnaea peregra* in serves primarily to:*

- A. provide the primary evidence for the developmental theory that is introduced in paragraph 4.
- B. resolve the inadequacies of the evolutionary mechanism by introducing the concept of genetic predisposition.
- C. demonstrate that maternally determined handedness is a common and well-understood phenomenon.
- D. highlight an empirical anomaly that the evolutionary mechanism is unable to account for.

*3. The evolutionary mechanism described in paragraph 2 is considered "not... adequate" because it fails to:*

- A. consider the possibility that sinistral and dextral snails are exact mirror images of one another.
- B. explain why any sinistral snails have survived if they have so many evolutionary disadvantages.
- C. account for the observable, non-probabilistic genetic anomalies in snail broods.
- D. explain why right-handedness is "commoner" in species where each parent contributes equally to handedness.

*4. Which of the following findings would most seriously weaken the "explicit developmental mechanism" proposed in the passage?*

- A. The discovery that the "dextral gene" protein is only produced and found in the cytoplasm after the egg has been fertilized.
- B. The identification of a species where injecting sinistral cytoplasm into dextral eggs does change their handedness.

- C. A finding that the "dextral gene" protein is also present in sinistral eggs, but in a dormant, deactivated state.  
D. The discovery of a predominantly sinistral species that has no "dextral gene" at all.

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. Pliny wrote that within his lifetime, only a single stalk was discovered.
2. Some think it was driven to extinction, others that it's still hiding in plain sight as a Mediterranean weed.
3. With just a handful of stylised images and the accounts of ancient naturalists to go on, the true identity of the Romans' favourite herb is a mystery.
4. But today, silphium has vanished – possibly just from the region, possibly from our planet altogether.

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: If our evolution is a cosmic lottery, the Universe might be full of unclaimed tickets.

Paragraph: The answer begins with life's improbable beginnings. \_\_\_\_ (1) \_\_\_\_ . Abiogenesis — the process by which life sparks from non-life — may be so unlikely that Earth represents a singular triumph in an otherwise barren cosmos. \_\_\_\_ (2) \_\_\_\_ . Even under ideal conditions, life doesn't simply spring forth; no experiment has succeeded in replicating it. \_\_\_\_ (3) \_\_\_\_ . Earth's unique circumstances — a stabilizing Moon, plate tectonics, and precisely the right chemical mix — might be one in a trillion. Evolution adds yet another filter: While microbial life could be common, the leap to intelligent beings may require an almost comical series of accidents and near-catastrophes. \_\_\_\_ (4) \_\_\_\_ .

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

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. There is, however, a third type of reason why philosophical writing is often inaccessible, and it is that the author consciously intends it to be so.
2. These commentators did accept that intentional obscurity can be commendable if it is designed to stimulate the reader to learn through grappling with the text.

3. This was recognised by the scholars of Ancient Greece and Rome, and those of the Middle Ages, who commented on the treatises of Plato and Aristotle.

4. They symbolised this sort of obscurantism with the cuttlefish, which discharges ink to cloud the water around it.

5. These commentators criticised writing in which the intentional obscurity was designed to prevent readers from understanding or refuting it.

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

Research is revealing the profound effect persistent low-level inflammation has on the brain and what this means not only for depression, but for anxiety, schizophrenia, Alzheimer's and more. By unpicking the mechanisms driving these connections, researchers are coming up with new ways to protect people's brains and mental health, on top of the many day-to-day ways we can help ourselves. Our immune defences are vital for survival. When the body detects an infection or injury, it activates an immune response, characterised by a cascade of inflammatory proteins called cytokines, to eliminate the pathogen and promote tissue repair. "Sickness behaviour" can also be triggered – a constellation of symptoms such as fatigue, social withdrawal and loss of appetite that is strikingly similar to major depression. In the acute phase of an illness, this behaviour is beneficial and signals the need to rest and recover during times of physical injury or infection.

A. Cytokines play a destructive role in brain health, and controlling their release may be key to preventing mental illnesses.

B. The immune system's inflammatory response, while crucial for healing, is the primary cause of mental disorders such as depression and schizophrenia.

C. Inflammation, though vital for fighting infection, can also influence brain function and mental health, offering insights into conditions like depression and Alzheimer's.

D. "Sickness behaviour" is an abnormal immune reaction that mimics mental illness and should be treated as a psychological disorder.

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: Picture a lively town square, the air buzzing with anticipation as the townsfolk gather to watch a tightrope walker perform.

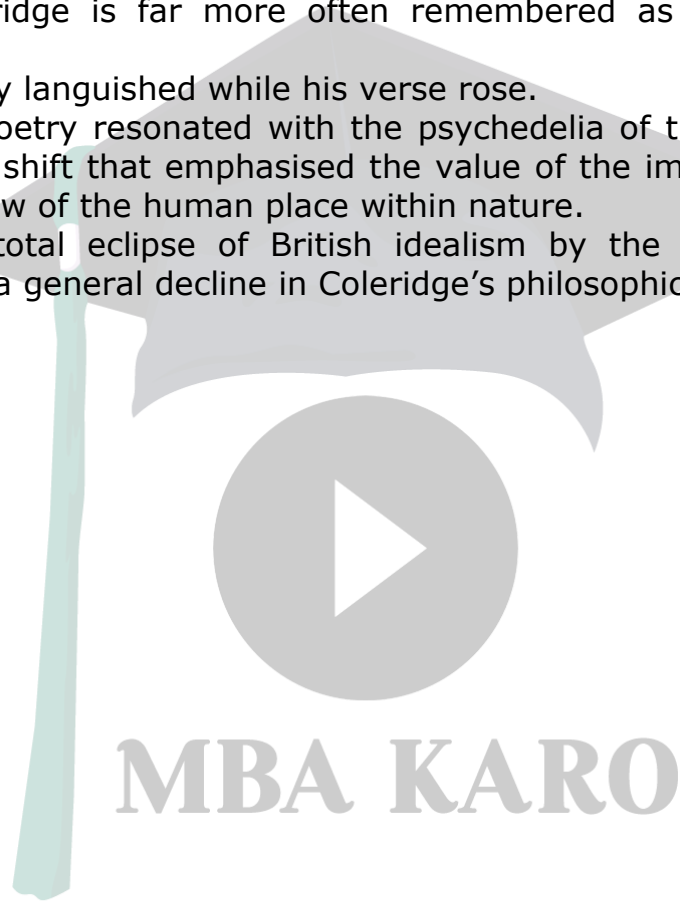
Paragraph: \_\_\_\_ (1) \_\_\_\_ . The book itself opens with Zarathustra's spectacular failure to connect, as he tries to talk over the heads of his audience. \_\_\_\_ (2) \_\_\_\_ . Out of nowhere appears Zarathustra, a hermit who has spent ten years in mountain solitude and seems to have forgotten how to communicate with mere mortals. \_\_\_\_ (3) \_\_\_\_ . Without any smooth introduction or attempt to win them over, he launches straight into his grand vision of the Overhuman: the next evolutionary leap beyond

humanity. \_\_\_\_ (4) \_\_\_\_ . "Man," he proclaims, "is nothing more than a rope stretched over an abyss between the animal and the Overhuman."

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

10. 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. Today, Coleridge is far more often remembered as a poet than a philosopher.
2. His philosophy languished while his verse rose.
3. Coleridge's poetry resonated with the psychedelia of the 1960s and a general cultural shift that emphasised the value of the imagination and a more holistic view of the human place within nature.
4. The almost-total eclipse of British idealism by the rise of analytic philosophy saw a general decline in Coleridge's philosophical stock.



**DILR**

Six friends played a game of rolling dice. There were 4 rounds. Each person rolled a different number in each round, and each round resulted in all six numbers rolled by different persons.

- For each of Preethi, Vivek and Anita, the numbers rolled in the four rounds were in A.P. The sums of the four numbers rolled by Preethi, Vivek and Anita were also in A.P.
- The sums of four numbers rolled by Avinash, Radha and Navdeep were also in A.P., with a common difference of 1, not necessarily in that order.
- The numbers rolled by Preethi in R2, Vivek in R4 and Anita in R3 were the same.
- Vivek rolled a higher number in R3 as compared to what he rolled in R2.

The following table provides partial information about the numbers rolled by them:

	<b>R1</b>	<b>R2</b>	<b>R3</b>	<b>R4</b>
<b>Preethi</b>	6			4
<b>Radha</b>	2			
<b>Anita</b>	4			
<b>Navdeep</b>	5			
<b>Avinash</b>	3			5
<b>Vivek</b>	1			

11. What is the sum of the four numbers rolled by Avinash?

- A. 13
- B. 14
- C. 15
- D. 16

12. What was the number rolled by Vivek in R3?

13. What was the number rolled by Radha in R2?

14. Which two friends have the same total?

- A. Anita and Navdeep
- B. Navdeep and Avinash
- C. Avinash and Anita
- D. No two persons have the same total

15. Which of these friends did not roll a six?

- A. Radha
- B. Anita
- C. Navdeep
- D. Avinash

12 candidates appeared for a test that had five questions. The correct answer for each question was either 'True' or 'False'. The candidates gave different answer sets. That is, no two candidates answered all five questions in the same manner. 1 mark was awarded for a right answer and 0 for a wrong answer. Six of the candidates, Alex, Ben, Corey, Dan, Edwin and Fin, got equal marks and were selected as they secured the highest marks among the 12 candidates. George, Harry and Ivan were among the rest six who failed to get selected. The table below gives their responses. T – True, F – False.

	Q1	Q2	Q3	Q4	Q5
George	T	F	F	F	F
Harry	F	T	T	T	F
Ivan	T	T	T	F	T

16. How many marks did Ben get?

17. How many marks did Ivan get?

18. The correct answers to questions 1 and 2 in order are

- A. True, True
- B. True, False
- C. False, True
- D. False, False

19. The correct answers to questions 4 and 5 in order are

- A. True, True
- B. True, False
- C. False, True
- D. False, False

20. The correct answer to question 3 is the same as the correct answer to which question(s)?

- A. 1
- B. 2
- C. 1 and 2
- D. 2 and 4

**QA**

21. Manish and Nikhil started a business together with the investments of Rs. 6 lakhs and Rs. 9 lakhs, respectively. They agreed to receive 25% and 20% of the profit as their salaries, and the remaining is distributed according to their investments. Find the sum of their monthly salaries if the difference in the total amount received by them is Rs. 225,000.

- A. ₹ 1,40,625
- B. ₹ 1,35,125
- C. ₹ 1,31,750
- D. ₹ 1,27,500

22. Solve for  $x$ :  $|x+1| - |x| + 3|x-1| - 2|x-2| = x+2$

- A.  $x = -2 \cup (1, \infty)$
- B.  $x = -1 \cup [1, \infty)$
- C.  $x = -2 \cup [2, \infty)$
- D.  $x = -1 \cup (2, \infty)$

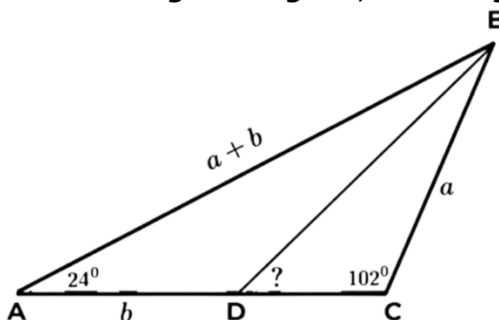
23. Find the number of common factors of 9000, 12600 and 19800.

24. Two shooters who are 510 m apart shoot a bullet each whose speeds are in the ratio 8:15. The bullets collide at a right angle after 3 seconds and are reflected by  $90^\circ$  to their original direction. The speed of the first bullet remains the same, while the speed of the second bullet is reduced by 60%. How far are the bullets from each other five seconds after their collision?

- A. 400 m
- B. 500 m
- C. 600 m
- D. 700 m

25. Four friends, Astha, Bharti, Chitra and Dipika went to eat paani poori. Astha ate half of the sum of the number of paani pooris eaten by others. Bharti ate one-fourth of the sum of the number of paani pooris eaten by others. Chitra ate one-eighth of the sum of the number of paani pooris eaten by others. Find the least possible number of paani poris eaten by four of them.

26. In the given figure, find angle BDC.



- A.  $39^\circ$
- B.  $45^\circ$
- C.  $48^\circ$
- D.  $51^\circ$

27. If the 30<sup>th</sup> term of a harmonic progression is  $-1/17$ , and its 20<sup>th</sup> term is 1, then its largest term is

- A. 1
- B.  $3/2$
- C.  $17/8$
- D.  $5/3$

28. The ratio of selling prices of A, B and C is 29:27:22, and the ratio of profit percentages on selling A, B and C is 4:2:5, respectively. It is given that the cost of A and B is the same, while the cost of C is 440. What is the overall profit percentages?

- A. 14.15%
- B. 15.33%
- C. 16.09%
- D. 14.78%

29. A bucket is in the form of a frustum of a cone of height 30 cm with radii of its lower and upper ends as 10 cm and 20 cm, respectively. Find the cost of milk (in Rs.) that can completely fill the container, at the rate of Rs 48 per litre.

30. If  $\sqrt{x-1} + \sqrt{y-1} + \sqrt{z-1} = \frac{x+y+z}{2}$ , find the value of  $5x + 3y + 2z$ .

- A. 10
- B. 15
- C. 17
- D. 20

MBA KARO