VARC

Read the passage below and answer the questions that follow:

There are various reasons why collapse could benefit human welfare. States often demanded tax in the form of grain. Without tax collectors passing by, people often had more to eat. More than that, without the pressure to grow tax crops, they often diversified their diet to include more animal protein, which beget stronger bones. A flight away from cities towards rural areas also meant less circulation of infectious disease. Finally, a more complex reason in at least some cases is a survivor effect. Some collapses did lead to population declines: sometimes death (which was obviously bad for those citizens) but, as we'll see later, also because people moved.

Either way, this meant that workers sticking around became scarcer and more valuable labour: they could bargain with their employers for better wages. Which is why we see both heights and wages rise after the Black Death in the 14th century. Women's heights appear to have decreased, but this is likely due to an earlier onset of menarche (the first menstrual cycle, which slows growth). Earlier menarche often occurs when girls experience better living conditions with more resources, counterintuitively resulting in lower long-term height. Hence the decreasing height of women is likely an indicator that they too were benefitting after the Black Death.

Perhaps the most neglected reason for post-collapse health boosts is that most states of the past were predatory, fuelling enormous inequality and impoverishing the masses. One review of 28 premodern states, from the time of Rome to 1947, found that they were on average more than three-quarters towards the theoretical maximum level of wealth inequality. That maximum is a situation in which one person owns all the surplus resources while everyone else is left with meagre subsistence (just enough to survive and reproduce). The most reliable effect of collapse was to level these wealth inequalities.

All this helps to explain why the adoption of agriculture and states were an enormous blow to human health. Not only did human height shrink but bones got weaker, teeth filled with more holes, and new infectious diseases such as influenza and the plague began as people were crammed together with animals. Men today are on average still shorter than their ancestors during the stateless ice age (or at least the male skeletons we've found in Europe; evidence elsewhere is sparse, but we have little reason to think that Europeans were especially tall).

Improved welfare after a state breaks down is not a purely ancient phenomenon either. That is clear when we look at the case of the collapse

of Somalia in 1991. The Barre regime that had previously ruled the country fell apart; local warlords and traditional groups took the reins of governance. While there was increased conflict, it was not a nightmare for human wellbeing. Instead, almost every quality-of-life indicator in the country, from infant mortality to extreme poverty, improved. This wasn't just Somalia experiencing a region-wide improvement due to better technology and aid. Its improvements significantly outstripped those of its intact, stable neighbours.

1. The author mentions the decrease in women's heights after the Black Death primarily to:
A. strengthen the argument for improved welfare by pre-empting and resolving an apparent contradiction.
B. argue that the benefits of the survivor effect were not shared equally between men and women.
C. introduce a paradox that is left unresolved, suggesting the data is inconclusive.
D. suggest that the survivor effect led to nutritional deficiencies for women but not for men.

2. The author discusses the case of Somalia in 1991 for all of the following reasons EXCEPT:
A. to show that a breakdown in a formal state structure does not invariably lead to a nightmare for human well-being.
B. to counter the potential argument that the benefits of collapse are a purely ancient phenomenon.
C. to demonstrate that the quality-of-life improvements were not simply part of a wider, regional trend.
D. to argue that governance by local warlords is superior to governance by a centralized regime.

3. Which of the following scenarios best exemplifies the theoretical maximum level of wealth inequality described in paragraph 3?
A. A society where the top 1% controls 90% of all wealth, while the bottom 99% controls the remaining 10%.
B. A society where all resources are owned by a single entity, which provides the rest of the population with just enough food and shelter to survive and reproduce.
C. A society where a ruling class demands high grain taxes, forcing farmers to abandon more nutritious crops.
D. A society where scarce labor after a plague allows workers to successfully bargain for higher wages and better working conditions.

4. Which of the following, if true, would most seriously weaken the author's argument?

A. New evidence from Asia shows that premodern states there were significantly less unequal than those in Europe.
B. The survivor effect is shown to be a rare phenomenon, as most population declines are quickly offset by high birth rates.
C. A study of 20th-century state collapses finds that 19 out of 20 led to immediate and catastrophic famines and disease outbreaks.
D. It is discovered that the stateless ice-age skeletons found in Europe were from a genetically distinct and taller subspecies of human.

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. When AI systems lack adequate exposure to a language, they have blind spots in their comprehension of human experience.
2. What's even more concerning is the imbalance between how many people speak a language in the physical world and how much that language is represented in online data.
3. For example, data from Common Crawl, one of the largest public sources of training data, reveals stark inequalities.
4. It contains more than 300 billion web pages spanning 18 years, but English dominates with 44 per cent of the content.

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 the richest people and nations voluntarily cut their carbon footprint, the entire world would benefit.
Paragraph: Tackling climate change is an inherently collectivist endeavour. ___(1)___. We only have one planet, with one atmosphere, and whenever anyone in the world emits greenhouse gases, we all feel the effects. ___(2)___. But some people have an outsized influence. Globally, the wealthiest 1 per cent are responsible for one-fifth of all emissions since 1990. ___(3)___. What if the wealthiest instead try to fix their carbon imbalance by funding geoengineering efforts that aim to cool the planet back down? ___(4)___. Here, the promise of global benefit is less certain.
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. The question is easier to grasp by looking at fields in which formal systems have long played a central role.
2. There is no single physical theory that explains everything.
3. Physics, for instance, has relied on formalisation for centuries.
4. But what, exactly, does it mean to formalise something like ethics?
5. Still, many have tried to formalise ethics by treating certain moral claims not as conclusions but as starting points.

8. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.
Drug addiction, immigration violations, and mental illness are rampant among the homeless population, so it's cruel to deny funds to groups that are on the front lines of the problem. Gender issues shouldn't even come into play here. These groups need to assist anyone in dire straits. The feds ought to focus on providing help, not advance their tangential cultural agendas. Nevertheless, I agree with the administration's expectation that funding recipients "operate in a city, county, or state that prohibits public camping." Unlike those other rules, this one applies directly to the homelessness problem. The U.S. Supreme Court's Grant's Pass decision last year finally freed localities to clear out park encampments. It overturned the Ninth Circuit's wacky Boise decision, which considered anti-camping statutes to be cruel and unusual punishment. Many California cities have taken advantage of the new latitude. Those that don't should look for funding elsewhere.
A. The author believes homelessness is caused mainly by addiction and mental illness, and therefore, federal funding should only go to rehabilitation.
B. The author criticizes the government for prioritizing cultural issues over practical measures to combat homelessness and supports restricting funds to cities that prohibit public camping.
programs.
C. The author supports all of the administration’s homelessness policies, particularly those allowing cities to remove encampments from public spaces.
D. The author argues that homelessness policy should focus on compassion and inclusivity rather than legal restrictions or ideological concerns.

9. 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. In 2013, together with his student Gerald Carter, Wilkinson set out to gauge the relative importance of friendship, based on the reciprocal exchange of meals versus that based on genetic kinship, in driving blood sharing.

2. Over the years, and then the decades, a much clearer picture of friendship among vampire bats has emerged.
3. So, blood sharing is more powerful than gene sharing.
4. After testing the waters, as Wilkinson and his colleagues describe it, the bats then took friendship to the next level and began the exchange of blood meals.
5. Friendship was 8.5 times more important!

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. To avoid that unsettling implication, he introduced a variable, L, the Greek symbol for lambda, to balance his equation.
2. According to his math, the universe should be volatile over time, either expanding or contracting.
3. In November 1915, he presented the equations underlying his general theory of relativity; 15 months later, he applied those equations to, as he phrased the topic in the paper's title, "cosmological considerations."
4. Albert Einstein, the second theorist who paved the way for the expansion discovery, did conceive of it.

DILR

The table below gives the marks of four students, Paul, Quinton, Ross and Sam, in three sections, namely VARC, DILR and QA. The list is sorted in ascending order of marks.

VARC	DILR	QA
4	12	16
10	16	20
12	20	24
14	24	28

- Paul got distinct marks in the three sections.
- Aggregate marks of Quinton and Sam are 58 and 52, respectively.
- Ross got equal marks in two sections, and his aggregate score is more than that of Paul.
- Quinton did not score 20 or 10 marks in any of the sections.

11. For how many persons can we uniquely determine their marks in all sections?

12. How many marks did Paul get in DILR?
A. 12
B. 16
C. 20
D. Cannot be determined

13. What was the lowest score Quinton had in any of the sections?

14. What is the maximum possible score of Ross?
A. 52
B. 54
C. 56
D. 58

15. What is the maximum possible score of Paul?
A. 38
B. 36
C. 40
D. 42

16. If all of them had a unique aggregate score, how many marks did Sam get in VARC?
A. 10
B. 12
C. 12 or 14
D. 10 or 14

CAT 50 Day Streak – Day 32

Abhijeet, Deepak, Gitesh, Harsh, Narayan, Rishabh and Sanket play a popular video game. The game has player rating which is the average of ratings obtained in the matches played by the person. They played a tournament consisting of three games. The table below gives the ratings of these players in those games:

Player	**Game 1**	**Game 2**	**Game 3**
Abhijeet	80	59	65
Deepak	77	56	70
Gitesh	52	67	85
Harsh	62	64	80
Narayan	91	77	
Rishabh		76	71
Sanket	74	64	

The rating is to be calculated in the following manner:
For instance, suppose Abhijeet had played 5 games before the start of the tournament and had a rating of 76, his rating after the tournament = {(76 x 5) + 80+59+65}/8 = 73

17. Gitesh had a rating of 79.4 and 77.5 before and after the tournament, respectively. How many games had he played before the tournament?
A. 10
B. 25
C. 15
D. 20

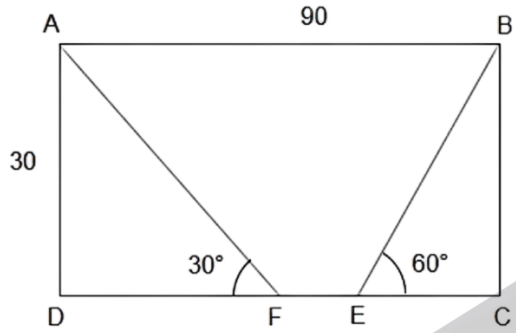
18. Before the tournament, Deepak had played twice as the matches played by Harsh. After the tournament, Deepak's rating dropped by 0.5 while that of Harsh dropped by 1. What was the difference between their ratings at the beginning of the tournament?
A. 1.5
B. 2.5
C. 3
D. Cannot be determined

19. Rishabh had played 13 games before the tournament. If his rating after the tournament increased from 72 to 72.5, what was his rating in game 1?

20. After the tournament, Narayan and Sanket had completed 15 and 21 games, respectively. Both had the same rating in game 3. If Sanket's rating after the tournament increased from 68.5 to 69, by how much did Narayan's rating increase?
A. 2.6
B. 2.7
C. 2.8
D. Cannot be determined

QA

21. In the given figure, ABCD is a rectangle with sides BC = AD = 30 units and AB = CD = 90 units. ∠AFD is 30°, and ∠BEC is 60°. Find the length of the median of the trapezium ABEF.



A. 90 - 10√3
B. 90 - 15√3
C. 90 - 20√3
D. 90 - 30√3

22. Naresh bought some shirts for Rs. 600 per shirt, but received 20% more of the lot for free. He marked up the cost by 40% and gave a discount of 10%, but a bargainer bought the entire lot and received 1 shirt free after buying 7 shirts. Find the profit percentage from the entire transaction?
A. 31.6%
B. 32.3%
C. 33.2%
D. 34.5%

23. If x and y are integers and $\log_3 x + \log_3 y \geq 15$, find the least value of x+y.

24. What is the sum of all prime numbers less than 100 of the form $a^2 + b^2$, where a and b are distinct positive integers?
A. 466
B. 473
C. 502
D. 515

25. Find the area (in sq cm) of a trapezium whose parallel sides measure 14 cm and 35 cm, and the oblique sides measure 13 cm and 20 cm.

26. S alone can complete a piece of work in 30 days. The ratio of the efficiencies of P to Q is 5:4, and that of R to P is 3:5. The ratio of the efficiencies of Q to S is 2:3. P, Q, R, and S work together in pairs of two to complete the work. The sequence of work is as follows: P pairs with Q, R, and S, respectively, for one day each (in that order). Next, Q pairs with

R and S for one day each, and finally, R pairs with S for one day. The same sequence is then repeated continuously until the work is completed. If they continue working in this pattern, on which day will the work be completed?

A. 18^{th}
B. 19^{th}
C. 20^{th}
D. 21^{st}

27. A club is having a lottery. There are two prizes to be won. Every member of the club submits exactly one entry, and these entries are stored in a box. After this is done, Praveen sneaks 6 extra entries with his name into the box. The chance of him winning both prizes is 7%. How many people are members of the club?

A. 25
B. 19
C. 44
D. 32

28. If p and q are roots of $x^2 + 7x + 12 = 0$, then the equation whose roots
are $(p + q)^2$ and $(p – q)^2$ is

A. $x^2 – 50x + 49 = 0$
B. $x^2 + 50x – 49 = 0$
C. $x^2 + 50x + 49 = 0$
D. $x^2 – 50x – 49 = 0$

29. Pushkin took his dog for an evening walk to a park 4 kilometres from his home. As it was drizzling outside, he tied the dog up and went for the walk alone. The dog managed to untie itself in 20 minutes and started running towards the park. How far from the park (in m) did the dog meet Pushkin if the dog and Pushkin were moving at 5 km/h and 3 km/h, respectively?

30. A furniture company, Lakdi Waale, produces chairs (x) and tables (y). The total cost C (in rupees) is given by
$C(x, y) = 500x^2 + 1000y^2 - 1000xy + 40000$
Due to a labour contract, the total number of items produced must be exactly 80 units. Calculate the minimum production cost.

A. Rs. 8,00,000
B. Rs. 7,20,000
C. Rs. 6,80,000
D. Rs. 6,40,000