

1. Consider the following pattern of numbers:

$$\begin{array}{cccc} 8 & 10 & 15 & 13 \\ 6 & 5 & 7 & 4 \\ \frac{4}{6} & \frac{6}{11} & \frac{8}{16} & \frac{8}{?} \end{array}$$

What is the number at? in the above pattern?

A:)17

B:)19

C:)21

D:)23

Correct: A

$$\begin{array}{cccc} 8 & 10 & 15 & 13 \\ 6 & 5 & 7 & 4 \\ \frac{4}{6} & \frac{6}{11} & \frac{8}{16} & \frac{8}{?} \end{array}$$

1. $8 + 4 - 6 = 6$

2. $10 + 6 - 5 = 11$

3. $15 + 8 - 7 = 16$

4. $13 + 8 - 4 = 17$

The first number and the third number in each column is first added, and then the second number is subtracted from the total obtained. Thus, for the first column, we have $8+4=12$, and subtracting 6 from it, we get 6. This is the last number in the first column. Repeat this in all columns, and in the end, we get $13+8=21$, and $21-4=17$.

2. How many diagonals can be drawn by joining the vertices of an octagon?

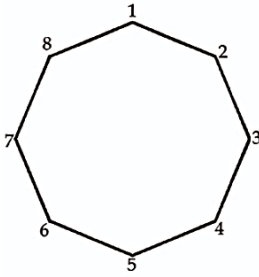
A:)20

B:)24

C:)28

D:)64

Correct:A



Each point on the octagon can be connected to (8-3) points.

So each point can form 5 diagonals.

So we get 40 in all.

However this includes similar pairs, i.e. 1-6, 6-1, 2-4, 4-2 etc.

So we divide this by 2.

So, answer is 20.

3. Global population was around 1.6 billion in 1990 – today it is around 7.2 billion and growing. Recent estimates on population growth predict a global population of 9.6 billion in 2050 and 10.9 billion in 2100. Unlike Europe and North America, where only three to four percent of population is engaged in agriculture, around 47 per cent of India's population is dependent upon agriculture. Even if India continues to do well in the service sector and the manufacturing sector picks up, it is expected that around 2030 when India overtakes China as the world's most populous country, nearly 42 per cent of India's population will still be predominantly dependent on agriculture.

Which of the following is the most logical and rational inference that can be made from the above passage?

- A:) Prosperity of agriculture sector is of critical importance of India.
- B:) Indian economy greatly depends on its agriculture.
- C:) India should take strict measures to control its rapid population growth.
- D:) India's farming communities should to improve their economic conditions.

Correct: B

Sol:

We are asked to determine the most logical and rational inference.

The passage talks about the percentage of population in various regions that are dependent on agriculture for their livelihood. According to the passage India has around 47% of its people working in agriculture. And going forward, the number is expected to be at least 42%, a huge proportion. So Option (b) is the most logical answer.

Option (a) is ruled out as it a value judgement, which is not the thrust of the passage. Option (c) is about a policy choice, not at all indicated in the passage. Option (c) is ruled out as that is a possibility, among many others, and nothing is actually hinted about it in the passage.

4. Many pathogens that cause foodborne illnesses are unknown. Food contamination can occur at any stage from farm to plate. Since most cases of food poisoning go unreported, the true extend of global foodborne illnesses is unknown. Improvements in international monitoring have led to greater public awareness, yet the rapid globalization of food production increases consumers' vulnerability by making food harder to regulate and trace. We have the world on our plates", says an official of WHO.

Which of the following is the most logical corollary to the above passage?

- A:)With more options for food come more risks.
- B:)Food processing is the source of all foodborne illnesses.
- C:)We should depend on locally produced food only.
- D:)Globalization of food production should be curtailed.

Correct:A

Sol:

A very simple question, as three options get eliminated directly.

The passage mainly talks about two things: 1. Food poisoning, and 2. Globalization of food production.

The passage says that "globalization of food production increases consumers vulnerability as food production becomes harder to regulate and trace. This clearly indicates that the best option is (a).

Option (b) and (c) are clearly incorrect as they are not mentioned anywhere.

Option (d) may be rejected as the passage, though criticizing globalization of food production, does not imply that globalization should be curtailed. Even the WHO statement does not hint at "curtallment, it only tells us the nature of our food today.

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5. I am a scientist, privileged to be somebody who tries to understand nature using the tools of science. But it is also clear that there are some really important questions that science cannot really answer, such as: Why is there something instead of nothing? Why are we here? In those domains, I have found that faith provides a better path to answers. I find it oddly anachronistic that in today's culture there seems to be widespread presumption that scientific and spiritual views are incompatible.

Which of the following is the most logical and rational inference that can be made from the above passage?

A:) It is the faith and not science that can finally solve all the problems of mankind.

B:) Science and faith can be mutually complementary if their proper domains are understood.

C:) There are some very fundamental questions which cannot be answered by either science or faith.

D:) In today's culture, scientific views are given more importance than spiritual views.

Correct: B

Sol:

Option (a) is clearly incorrect as it is not mentioned.

Option (d) is incorrect because nowhere in the passage is it written that scientific views are currently given more importance than cultural ones. The passage speaks of society considering science and faith incompatible.

The passage states that the author "finds it odd that even in today's culture there seems to be an assumption that scientific and cultural views are Incompatible. This infers that the author is in disagreement with the said fact and so option (b) is the best answer.

The passage does state that there are some fundamental questions which science is currently unable to give a reasonable answer to, but it doesn't mean that science is not capable of answering them. It may just be a matter of time. Also, the passage does not talk about faith not having answers. So option (c) is incorrect.

6. Though I have discarded much of past tradition and custom, and am anxious that India should rid herself of all shackles that bind and contain her and divide her people, and suppress vast numbers of them, and prevent the free development of the body and the spirit; though I seek all this, yet I do not wish to cut myself off from that past completely. I am proud of that great inheritance that has been and is, ours and I am conscious that I

too, like all of us, am a link in that unbroken chain which goes back to the dawn of history in the immemorial past of India.

The author wants India to rid herself of certain past bonds because

A:)he is not able to see the relevance of the past

B:)there is not much to be proud of

C:)he is not interested in the history of India

D:)they obstruct her physical and spiritual growth

Correct:D

Sol:

Since the options can be eliminated easily, the question is an easy one!

The use of words like "shackles" and "bind" and "suppress" clearly show the author's view that certain past bonds obstruct "her physical and spiritual growth" (people and India considered synonymously). Option (d) is the best answer.

Options (b) and (c) are incorrect because the author has shown interest, appreciation and pride in India's past on a whole.

Option (a) is incorrect for the same reason.

7.If x between -3 and -1 , and Y is between -1 and 1 , then $X^2 - Y^2$ is in between which of the following?

A:)-9 and 1

B:)-9 and -1

C:)0 and 8

D:)0 and 9

Correct:D

Sol:

If X is between $-3, -1$

Then X^2 is between 1 to 9

If Y is between $-1, 1$

Then Y^2 is between $0, 1$

$-X^2 - Y^2$ is between $0, 9$.

8. X and Y are natural numbers other than 1, and Y is greater than X. Which of the following represents the largest number?

A:)XY

B:)X/Y

C:)Y/X

D:)(X+Y)/XY

Correct: A

Sol:

$$y > x > 1$$

$$x/y > x/y \text{ as } x/y < 1$$

$$xy > y/x \text{ as } y/x < y \text{ and } xy > y$$

$$xy > \frac{x+y}{xy} \text{ as } xy > \frac{x}{y} + \frac{1}{x} \text{ as } \frac{1}{y} + \frac{1}{x} < 2$$

$$\text{but } xy > 2.$$

9. The plan of an office block for six officers A, B, C, D, E and F is as follows: Both B and C occupy offices to the right of the corridor (as one enter the office block) and A occupies on the left of the corridor. E and F occupy offices on opposite sides of the corridor but their offices do not face each other. The offices of C and D face each other. E does not have a corner office. F's office is further down the corridor than A's, but on the same side.

If E sits in his office and faces the corridor, whose office is to his left?

A:)A

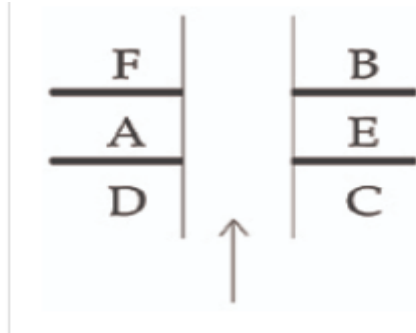
B:)B

C:)C

D:)D

Correct:C

Sol:



10. The plan of an office block for six officers A, B, C, D, E and F is as follows: Both B and C occupy offices to the right of the corridor (as one enters the office block) and A occupies on the left of the corridor. E and F occupy offices on opposite sides of the corridor but their offices do not face each other. The offices of C and D face each other. E does not have a corner office. F's office is further down the corridor than A's, but on the same side.

Who is/are F's immediate neighbour/ neighbours?

A:)A only

B:)A and D

C:)C only

D:)B and C

Correct:A

Read the following passage and answer the items that follow. Your answers to these items should be based on the passages only.

Passage

11. A diversity of natural assets will be needed to cope with climate change and ensure productive agriculture, forestry, and fisheries. For example, crop varieties are needed that perform well under drought, heat, and enhanced CO₂. But the private – sector and farmer – led process of choosing crops favours homogeneity adapted to past or current conditions, not varieties capable of producing consistently high yields in warmer, wetter, or drier conditions. Accelerated breeding programmes are needed to conserve a wider pool of genetic resources of existing crops, breeds, and their wild relatives. Relatively intact ecosystems, such as forested catchments, mangroves, wetlands, can buffer the impacts of climate change. Under a changing climate, these ecosystems are themselves at

risk, and management approaches will need to be more proactive and adaptive. Connections between natural areas, such as migration corridors, may be needed to facilitate species movements to keep up with the change in climate.

With reference to the above passage, which of the following would assist us in coping with the climate change?

1. Conservation of natural water sources
2. Conservation of wider gene pool
3. Existing crop management practices
4. Migration corridors

Select the correct answer using the code given below.

- A:) 1, 2 and 3 only
B:) 1, 2 and 4 only
C:) 3 and 4 only
D:) 1, 2, 3 and 4

Correct: B

Sol:

Another passage on climate change related issues.

Statement 2 is clearly wrong, as it goes against the question asked which of these will assist in coping with climate change?" Existing crop management practices (Statement 3) are directly against the idea of coping up with climate change.

Three options have 3- (a), (c) and (d). All can be eliminated!

Answer is (b).

You can quickly check if that is indeed correct-it is (b)-1, 2 and 4 only

12. A diversity of natural assets will be needed to cope with climate change and ensure productive agriculture, forestry, and fisheries. For example, crop varieties are needed that perform well under drought, heat, and enhanced CO₂. But the private – sector and farmer – led process of choosing crops favours homogeneity adapted to past or current conditions, not varieties capable of producing consistently high yields in warmer, wetter, or drier conditions. Accelerated breeding programmes are needed to conserve a wider pool of genetic resources of existing crops, breeds, and their wild relatives. Relatively intact ecosystems, such as forested catchments, mangroves, wetlands, can buffer the impacts of climate change. Under a changing climate, these ecosystems are themselves at

risk, and management approaches will need to be more proactive and adaptive. Connections between natural areas, such as migration corridors, may be needed to facilitate species movements to keep up with the change in climate.

With reference to the above passage, the following assumptions have been made:

1. Diversification of livelihoods acts as a coping strategy for climate change.

2. Adoption of monocropping practice

leads to the extinction of plant varieties and their wild relatives.

Which of the above assumption is / are valid?

A:) 1 only

B:) 2 only

C:) Both 1 and 2

D:) Neither 1 nor 2

Correct: B

Sol:

The passage talks about monocropping practices and how they pose a danger to native plant varieties. It says "...choosing crops favours homogeneity..."

However there is no mention of diversification of livelihoods in the passage. The opening line indicates "diversity of natural assets" not livelihoods.

13. Today, the top environmental challenge is a combination of people and their aspirations. If the aspirations are more like the frugal ones we had after the Second World War, a lot more is possible than if we view the planet as a giant shopping mall. We need to get beyond the fascination with glitter and understand that the planet works as a biological system.

Which of the following is the **most crucial and logical inference** that can be made from the above passage?

A:) The Earth can meet only the basic needs of humans for food, clothing and shelter.

B:) The only way to meet environmental challenge is to limit human population.

C:) Reducing our consumerism is very much in our own interest.

D:) Knowledge of biological systems can only help us save this planet.

Correct: C

Sol:

Another passage on environmental issues.

"Fascination with glitter" and "shopping mall" clearly states that the passage is trying to tell us to reduce our consumerism. Our top challenge is people and their aspirations, and they are guided by consumerism hence (c) is best.

Option (a) is not chosen as it is not explicitly mentioned

Option (b) is wrong.

Option (d) is incorrect as "knowledge of biological systems is different from understanding the fact that the Earth is a biological system"

14.Some people believe that leadership is a quality which you have at birth or not at all. This theory is false, for the art of leadership can be acquired and can indeed be taught. This discovery is made in time of war and the results achieved can surprise even the instructors. Faced with the alternatives of going left or right, every soldier soon grasps that a prompt decision either way is better than an endless discussion. A firm choice of direction has an even chance of being right while to do nothing will be almost certainly wrong.

The author of the passage holds the view that

A:)leadership can be taught through war experience only

B:)leadership can be acquired as well as taught

C:)the results of training show that more people acquire leadership than are expected

D:)despite rigorous instruction, very few leaders are produced

Correct:B

Sol:

The passage says that the theory that people are born with leadership qualities (or not at all) is false and that leadership can be naturally acquired or can be taught. So the best possible answer is (b).

Option (a) is wrong as that is not the only way.

Option (c) is wrong as any comparison of numbers is not provided.

Option (d) is not mentioned anywhere.

15. A solid cube of 3 cm side, painted on all its faces, is cut up into small cubes of 1 cm side. How many of the small cubes will have exactly two painted faces?

A:)12

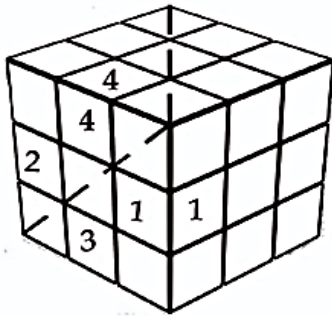
B:)8

C:)6

D:)4

Correct:A

Sol:



4 cubes on each face, and 12 in total.

16. If $\text{Pen} < \text{Pencil}$, $\text{Pencil} < \text{Book}$ and $\text{Book} > \text{Cap}$, then which one of the following is always true?

A:) $\text{Pen} > \text{Cap}$

B:) $\text{Pen} < \text{Book}$

C:) $\text{Pencil} = \text{Cap}$

D:) $\text{Pencil} > \text{Cap}$

Correct:B

Sol:

$\text{Pen} < \text{Pencil}$

$\text{Pencil} < \text{Book}$

So, $\text{Pen} < \text{Book}$. A simple question!

17. Read the information given below and answer the item that follows.

A, B C and D are students. They are studying in four different cities, viz, P,Q, R and S (not necessarily in that order). They are studying in Science college, Arts college, Commerce college and Engineering college (not necessarily in that order), which are situated in four different states, viz., Gujarat, Rajasthan , Assam and Kerala (not necessarily in that order).

Further, it is given that –

(i) D is studying in Assam

(ii) Arts college is located in city S which is in Rajasthan

(iii) A is studying in Commerce college

(iv) B is studying in city Q

(v) Science college is located in Kerala

A is studying in

A:) Rajasthan

B:) Gujarat

C:) City Q

D:) Kerala

Correct: B

Sol:

The correct pairing is

The correct pairing is

City

A → P → Commerce → Gujarat

B → Q → Science → Kerala

C → S → Arts → Rajasthan

D → R → Engineering → Assam

18. Read the information given below and answer the item that follows.

A, B C and D are students. They are studying in four different cities, viz, P,Q, R and S (not necessarily in that order). They are studying in Science college, Arts college, Commerce college and Engineering college (not necessarily in that order), which are situated in four different states, viz., Gujarat, Rajasthan , Assam and Kerala (not necessarily in that order).

Further, it is given that –

(i) D is studying in Assam

(ii) Arts college is located in city S which is in Rajasthan

(iii) A is studying in Commerce college

(iv) B is studying in city Q

(v) Science college is located in Kerala

Science college is located in

A:) city Q

B:) city S

C:) city R

D:) city P

Correct: A

Sol:

City

A → P → Commerce → Gujarat

B → Q → Science → Kerala

C → S → Arts → Rajasthan

D → R → Engineering → Assam

See pairing above

19. Read the information given below and answer the item that follows.

A, B, C and D are students. They are studying in four different cities, viz, P, Q, R and S (not necessarily in that order). They are studying in Science college, Arts college, Commerce college and Engineering college (not necessarily in that order), which are situated in four different states, viz., Gujarat, Rajasthan, Assam and Kerala (not necessarily in that order).

Further, it is given that –

(i) D is studying in Assam

(ii) Arts college is located in city S which is in Rajasthan

(iii) A is studying in Commerce college

(iv) B is studying in city Q

(v) Science college is located in Kerala

C is studying in

A:) Science college

B:) Rajasthan

C:) Gujarat

D:) city Q

Correct:B

City

A → P → Commerce → Gujarat

B → Q → Science → Kerala

C → S → Arts → Rajasthan

D → R → Engineering → Assam

See pairing above

20. Read the information given below and answer the item that follows.

A, B C and D are students. They are studying in four different cities, viz, P,Q, R and S (not necessarily in that order). They are studying in Science college, Arts college, Commerce college and Engineering college (not necessarily in that order), which are situated in four different states, viz., Gujarat, Rajasthan , Assam and Kerala (not necessarily in that order).

Further, it is given that –

- (i) D is studying in Assam
- (ii) Arts college is located in city S which is in Rajasthan
- (iii) A is studying in Commerce college
- (iv) B is studying in city Q
- (v) Science college is located in Kerala

Which one of the following statements is correct?

- A:) D is not studying in city S.
- B:) A is studying in Science college
- C:) A is studying in Kerala.
- D:) Engineering college is located in Gujarat.

Correct:A

City

A → P → Commerce → Gujarat

B → Q → Science → Kerala

C → S → Arts → Rajasthan

D → R → Engineering → Assam

See pairing above

21. Read the information given below and answer the item that follows.

A, B C and D are students. They are studying in four different cities, viz, P,Q, R and S (not necessarily in that order). They are studying in Science college, Arts college, Commerce college and Engineering college (not necessarily in that order), which are situated in four different states, viz., Gujarat, Rajasthan , Assam and Kerala (not necessarily in that order). Further, it is given that –

- (i) D is studying in Assam
- (ii) Arts college is located in city S which is in Rajasthan
- (iii) A is studying in Commerce college
- (iv) B is studying in city Q
- (v) Science college is located in Kerala

Which one of the following statements is correct regarding Engineering college?

A:)C is studying there.

B:)B is studying there.

C:)It is located in Gujarat.

D:)D is studying there.

Correct:D

City

A → P → Commerce → Gujarat

B → Q → Science → Kerala

C → S → Arts → Rajasthan

D → R → Engineering → Assam

See pairing above

22.Read the information given below and answer the item that follows.

A, B C and D are students. They are studying in four different cities, viz, P,Q, R and S (not necessarily in that order). They are studying in Science college, Arts college, Commerce college and Engineering college (not necessarily in that order), which are situated in four different states, viz., Gujarat, Rajasthan , Assam and Kerala (not necessarily in that order). Further, it is given that –

- (i) D is studying in Assam
- (ii) Arts college is located in city S which is in Rajasthan

(iii) A is studying in Commerce college

(iv) B is studying in city Q

(v) Science college is located in Kerala

Which one of the following statements is correct?

A:)Engineering college is located in Assam.

B:)city Q is situated in Assam.

C:)C is studying in Kerala.

D:)B is studying in Gujarat.

Correct:A

City

A → P → Commerce → Gujarat

B → Q → Science → Kerala

C → S → Arts → Rajasthan

D → R → Engineering → Assam

See pairing above

23.A shopkeeper sells an article at ₹40 and gets x% profit. However, when he sells it at ₹20, he faces same percentage of loss. What is the original cost of the article?

A:)₹10

B:)₹20

C:)₹30

D:)₹40

Correct:C

Sol:

$$CP + \frac{x}{100} CP = \text{Rs. } 40$$

$$CP - \frac{x}{100} (CP) = \text{Rs. } 20$$

On solving CP = Rs. 30

$$\Rightarrow x = 33.33$$

24. There are 24 equally spaced points lying on the circumference of a circle. What is the maximum number of equilateral triangles that can be drawn by taking sets of three points as the vertices?

A:)4

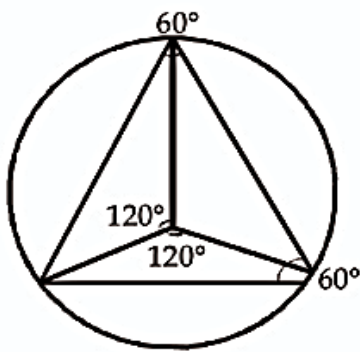
B:)6

C:)8

D:)12

Correct:C

Sol:



According to a property of circles, angle subtended at centre is double than that at the circumference.

So, we need 60° (for condition of equilateral triangles)

So, we need 120° at centre.

According to symmetry, we can get $24/[(360)/120] = 8$ equilateral triangles.

25. A lift has the capacity of 18 adults or 30 children. How many children can board the lift with 12 adults?

A:)6

B:)10

C:)12

D:)15

Correct:B

Sol:

18 adults = 30 children

1 adult = $\frac{30}{18}$ children

So with 12 adults 6 more adults can board

i.e. $12 + \frac{30}{18}(6) \Rightarrow 22$ total people

So, out of 22 total people, 10 are children

26. Lakshmi, her brother, her daughter and her son are badminton players. A game of doubles is about to begin :

(i) Lakshmi's brother is directly across the net from her daughter.

(ii) Her son is diagonally across the net from the worst player's sibling.

(iii) The best player and the worst player are on the same side of the net.

Who is the best player?

A:) Her brother

B:) Her daughter

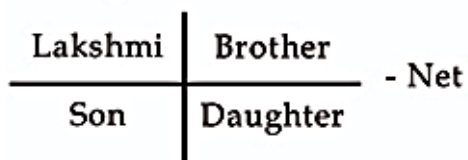
C:) Her son

D:) Lakshmi

Correct: A

Sol:

Arrangement is



Best player is her brother.

27. Read the following passage and answer the item that follow. Your answers to these items should be based on the passages only

Passage

The quest for cheap and plentiful meat has resulted in factory farms where more and more animals are squeezed into smaller lots in cruel and shocking conditions. Such practices have resulted in many of the world's health pandemics such as the avian flu. Worldwide, livestock are increasingly raised in cruel, cramped conditions, where animals spend their short lives under artificial light, pumped full of antibiotics and growth hormones, until the day they are slaughtered. Meat production is water-intensive. 15000 litres of water is needed for every kilogram of meat compared with 3400 litres for rice, 3300 litres for eggs and 255 litres for a kilogram of potatoes.

What is the most rational and crucial message given by the passage?

- A:) Mass production of meat through industrial farming is cheap and is suitable for providing protein nutrition to poor countries.
- B:) Meat-producing industry violates the laws against cruelty to animals.
- C:) Mass production of meat through industrial farming is undesirable and should be stopped immediately.
- D:) Environmental cost of meat production is unsustainable when it is produced through industrial farming.

Correct: D

The passage focuses on mainly two aspects :

1. Cruelty to animals which are slaughtered in factory farms, and
2. High environmental cost of maintaining such farms instead of, say, organic free roam poultry or other methods.

Option (a) is the opposite of what is being said.

Option (b) is correct but it is not the most crucial message being given.

Option (c) is an extreme statement, and not a recommendation being given.

Option (d) is an extreme statement, and not a recommendation being given.

28. Read the following passage and answer the item that follow. Your answers to these items should be based on the passages only

Passage

A male tiger was removed from Pench Tiger Reserve and was relocated in Panna National Park. Later, this tiger trekked toward his home 250 miles away. The trek of this solitary tiger highlights a crisis. Many wildlife reserves exist as islands of fragile habitat in a vast sea of humanity, yet tigers can range over a hundred miles, seeking prey, mates and territory. Nearly a third of India's tigers live outside tiger reserves, a situation that is dangerous for both human and animal. Prey and tigers can only disperse if there are recognized corridors of land between protected areas to allow unmolested passage.

Which of the following is the most rational and crucial message given by the passage?

A:)The conflict between man and wildlife cannot be resolved, no matter what efforts we make,

B:)Safe wildlife corridors between protected areas is an essential aspect of conservation efforts.

C:)India needs to declare more protected areas and set up more tiger reserves.

D:)India's National Parks and Tiger Reserves need to be professionally managed.

Correct:B

Sol:

The passage focuses on the problems with relocation of wild animals, especially animals like tigers as they tend to wander towards their original place of living.

This puts the tigers at risk of human hunting and also puts the native human population at risk. So the solution offered here is the presence of wildlife corridors in which wild animals can safely travel.

29. Read the following passage and answer the item that follow. Your answers to these items should be based on the passages only

Passage

A male tiger was removed from Pench Tiger Reserve and was relocated in Panna National Park. Later, this tiger trekked toward his home 250 miles away. The trek of this solitary tiger highlights a crisis. Many wildlife reserves exist as islands of fragile habitat in a vast sea of humanity, yet tigers can range over a hundred miles, seeking prey, mates and territory. Nearly a third of India's tigers live outside tiger reserves, a situation that is dangerous for both human and animal. Prey and tigers can only disperse if there are recognized corridors of land between protected areas to allow unmolested passage.

With reference to the above passage, the following assumptions have been made:

1. The strategy of conservation of wildlife by relocating them from one protected area to another is not often successful.
2. India does not have suitable legislation to save the tigers, and its conservation efforts have failed which forced the tigers to live outside protected areas.

Which of the above assumptions is/are valid?

- A:)I only
- B:)2 only
- C:)Both 1 and 2
- D:)Neither I nor 2

Correct: A

Sol:

India does have suitable legislation that help in saving the tiger population. Further, that is not the topic of discussion in this passage. Hence,

statement 2 is ruled out.

However, due to the absence of wildlife corridors in the country, relocating of wild animals is often unsuccessful.

30. Read the following passage and answer the items that follow each passage. Your answers to these items should be based on the passages only

Passage

Climate change may actually benefit some plants by lengthening growing seasons and increasing carbon dioxide. Yet other effects of a warmer world, such as more pests, droughts, and flooding, will be less benign. How will the world adapt? Researchers project that by 2050, suitable croplands for four commodities - maize, potatoes, rice and wheat - will shift, in some cases pushing farmers to plant new crops. Some farmlands may benefit from warming, but others won't. Climate alone does not dictate yields; political shifts, global demand, and agricultural practices will influence how farms fare in the future.

Which one of the following is the most logical and rational inference that can be made from the above passage?

- A:) Farmers who modernize their methods and diversify their fields will be in an advantageous position in future.
- B:)Climate change will adversely affect the crop diversity.
- C:)Shifting major crops to new croplands will lead to a great increase in the total area under cultivation and thus an increase production. in overall agricultural production.
- D:)Climate change is the most important factor affecting the agricultural economy in the future.

Correct: D

Sol:

Option (a) is not necessarily true always. Even after doing all that, other factors may not allow farmers any advantage. Option (b) is not mentioned. Option (c) is wrong as it is not discussed in this manner. Option (d) is the best. That is the overriding theme of the passage.

31. Read the following passage and answer the items that follow each passage. Your answers to these items should be based on the passages only

Passage

A bat's wings may look like sheets of skin. But underneath, a bat has the same five fingers as an orangutan or a human, as well as a wrist connected to the same cluster of wrist bones connected to the same long bones of the arm. What can be more curious than that the hand of a man, formed for grasping, that of a mole for digging, the leg of the horse, the paddle of the porpoise, and the wing of the bat, should all be constructed on the same pattern?

Which one of the following is the most logical, scientific and rational inference that can be made from the above passage?

- A:) Different species having similar structure of hands is an example of biodiversity.
- B:)Limbs being used by different species for different kinds of work is an example of biodiversity.
- C:)Man and the aforementioned animals having similar structure of limbs is an example of coincidence in evolution.
- D:)Man and the aforementioned animals have a shared evolutionary history.

Correct: D

Sol:

Option (a) is not mentioned specifically. Option (b) again talks about "biodiversity" but limbs being used for different purpose is not biodiversity! Option (c) sound correct, but is not, as "coincidence in evolution" is not explicitly mentioned. Option (d) is best as "a shared evolutionary history" makes it a "very curious situation".

32. Read the following passage and answer the items that follow each passage. Your answers to these items should be based on the passages only

Passage

Around 56 million years ago, the Atlantic Ocean had not fully opened and animals, perhaps including our primate ancestors, could walk from Asia to North America through Europe and across Greenland. Earth was warmer than it is today, but as the Palaeocene epoch gave way to Eocene, it was about to get much warmer still - rapidly and radically. The cause was a massive geologically sudden release of carbon. During this period called Palaeocene - Eocene Thermal Maximum or PETM, the carbon injected into the atmosphere was roughly the amount that would be injected today if humans burned all the Earth's reserves of coal, oil and natural gas. The PETM lasted for about 1,50,000 years, until the excess carbon was reabsorbed. It brought on drought, floods, insect plagues and a few extinctions. Life on Earth survived - indeed, it prospered - but it was drastically different.

Based on the above passage, the following assumptions have been made:

1. Global warming has a bearing on the planet's biological evolution.
2. Separation of land masses causes the release of huge quantities of carbon into the atmosphere.
3. Increased warming of Earth's atmosphere can change the composition of its flora and fauna.
4. The present man-made global warming will finally lead to conditions similar to those which happened 56 million years ago.

Which of the assumptions given above are valid?

A:) 1 and 2

B:) 3 and 4

C:) 1 and 3

D:) 2 and 4

Correct:C

Sol:

Assumption 1 is clearly valid. Assumption 2 is too far-fetched, and cannot be deduced. Assumption 3 is valid as clearly stated. Assumption 4 again is too far-fetched as the amounts involved are too high.

33.The number of times the digit 5 will appear while writing the integers from 1 to 1000 is

A:)269

B:)271

C:)300

D:)302

Correct: B

Sol:

From 1 to 1000, the numbers in which 5 can occur could be of one digit, two digits or three digits.

Case I-If the number is of one digit-5 will appear only one time, i.e. in 5.

Case II-If the number is of two digits - then

(a) There is only one 5, this can happen in two ways 5 and 5. In the first case (5) the blank place can be filled in a way as 0 and 5 cannot appear at that place), while in the second case (5) the blank place can be filled in 5 ways (5 cannot appear there). Total $9 \times 8 = 17$ ways.

(b) There are two 5s. In this case only ONE possibility.

Case III-If the number is of three digits-then

(a) Only one 5. Then, 5 can occupy three positions. 5 or 5_ or _5. In the first case (5...), remaining two positions can be filled in 9 ways each

So total $9 \times 9 = 81$ possibilities. In the second case (5) first position can be filled in 9 ways and last position can be filled in 3 ways. So total $9 \times 3 = 27$ possibilities. Same will be true for the third (5) case. So total 72 possibilities. (b) Only two 5s. This can be done in three ways 55 or 5_5 or 55. In first (55) and second (55) case it can be filled in 9 ways each. While in the third case (55) it can be filled in 8 ways. So total $9 \times 9 + 8 = 26$ possibilities (c) All three digits are 5. This can be done in only ONE way i.e., 555.

So, total $1 + 17 + 81 + 72 + 26 + 1 = 271$.

Ans.(b)

34.A and B are two heavy steel blocks. If B is placed on the top of A, the weight increases by 60%. How much weight will reduce with respect to the total weight of A and B, if B is removed from the top of A?

A:)60%

B:)45-5%

C:) 40%

D:)37-5%

Correct:D

Sol:

Let the weight of A be 100 kg.

So, the combined weight of A B will 160 kg. Out of this 160 kg, 60 kg is reduced now.

So problem now becomes "60 is what percent of 160?" So, $60 \times 100 / 160$ 37.5%.Ans.(d)

35.Consider the following Statements and Conclusions:

Statements:

1.Some rats are cats.

2.Some cats are dogs.

3.No dog is a cow.

Conclusions:

I.No cow is a cat.

II.No dog is a rat.

III.Some cats are rats.

Which of the above conclusions is/are drawn from the statements?

A:)I, II and III

B:)Only I and II

C:)Only III

D:)Only II and III

Correct: C

Sol:

The conclusion of "Some rats are cats" is "Some cats are rats. So conclusion III is valid. No conclusion can be drawn in terms of rats and dogs as statement I and II both are starting with some So, conclusion II is not valid. That eliminates all options but (c).

The only conclusion in terms of cat and cow will be 'Some cats are not cows. So conclusion I is not valid.

Ans.(c).

36.The number of parallelograms that can be formed from a set of four parallel lines intersecting another set of four parallel lines, is.

A:) 18

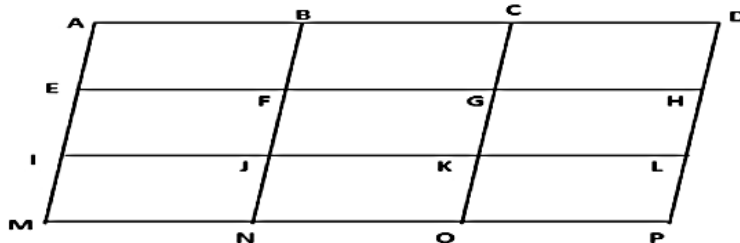
B:) 24

C:) 32

D:) 36

Correct:D

In the diagram, let's count the parallelograms one by one.



Case I - Parallelograms of 1×1 (ABFE type) - ABFE, BCGF, CDHG, EFJI, FGKJ, GHLK, IJNM, JKON, KLPO – total **9**.

Case II - Parallelograms of 1×2 (ACGE type) - ACGE, BDFH, EGKI, FHLJ, IKOM, JLPN – total **6**.

Case III - Parallelogram of 2×1 (ABJI type) - ABJI, EFNM, BCKJ, FGON, CDLK, GHPO – total **6**.

Case IV - Parallelograms of 1×3 (ADHE type) - ADHE, EHLI, ILPM – total **3**.

Case V - Parallelograms of 3×1 (ABNM type) - ABNM, BCON, CDPO – total **3**.

Case VI - Parallelograms of 2×2 (ACKI type) - ACKI, BDLJ, EGOM, FHPN – total **4**.

Case VII - Parallelograms of 3×2 (ADLI type) - ADLI, EHPM – total **2**.

Case VIII - Parallelograms of 2×3 (ACOM type) - ACOM, BDPN – total **2**.

Case IX - Parallelograms of 3×3 (ADPM type) – ADPM – total **1**.

Total **36**.

A much shorter method is by using permutations and combinations.

Select any two of the first set of 4 lines. That can be done in $4C_2$ ways.

Now select any two of the second set of 4 lines. That can also be done in $4C_2$ ways.

So the total number of ways of doing it = $4C_2 \times 4C_2 = 6 \times 6 = 36$ ways. **Ans. (d)**

37.When a runner was crossing the 12 km mark, she was informed that she had completed only 80% of the race. How many kilometres was the runner supposed to run in this event?

A:)14

B:)15

C:)16

D:)16.5

Correct: B

This can be solved mentally. 12 km is $\frac{8}{10}$ $\frac{4}{5}$ of the whole race. So whole race must be 15 km.

In this question 12 km is 80% of the total race.

=> 12 km = 0.8 R => R=12/0.815.

So total race will be of 15 km. Ans.(b)

38.In 2002, Meenu's age was one-third of the age of Meera, whereas in 2010, Meenu's age was half the age of Meera. What is Meenu's year of birth?

A:)1992

B:)1994

C:)1996

D:)1998

Correct:B

Let Meenu's age in 2002 be M and Meera's age in 2002 be X.

In 2002, Meenu = $\frac{1}{3}$ of Meera. => $M = \frac{X}{3}$

In 2010, Meenu= $\frac{1}{2}$ of Meera. So, $M+8 = \frac{(X + 8)}{2}$

Solving these two, we get $M = 8$. So, in 2002, Meenu was 8 years old. So she was born in 1994.

[You can easily reverse verify it with the options also now. If Meenu was born in 1994, then in 2002 she was 8 years old, and Meera was 24 yrs old. Then in 2010, Meenu would be 16 yrs old, and Meera should be 32 yrs old (and also twice that of Meenu, which she is now). Hence checked]

39.In a conference, out of a total 100 participants, 70 are Indians. If 60 of the total participants are vegetarian, then which of the following statements is/are correct?

1. At least 30 Indian participants are vegetarian.
2. At least 10 Indian participants are non-vegetarian.

Select the correct answer using the codes given below:

- A:) 1 only
B:) 2 only
C:) Both 1 and 2
D:) Neither 1 nor 2

Correct: C

Sol:

Let's try to maximise the number of Indian-Vegetarians. Out of 70 Indians, all vegetarians (ie, 60) can be Indians. So, at least 10 Indians will be there who will be non-vegetarians.

This number can increase depending on the number of vegetarian-Indians,

Let's try to minimise the number of Indian-Vegetarians. For that we have to maximise the number of non-Indian-Vegetarians. Out of 30 Non-Indians, at max all can be vegetarian, Still 30 vegetarians remain which will fall under Indian category. So, at least 30 Indians will be there who will be vegetarians. Hence both statements are correct.

Ans.(c)

40. Read the following passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.

Passage

Low-end IoT (Internet of Things) devices are cheap commodity items : addressing security would add to the cost. This class of items is proliferating with new applications; many home appliances, thermostats, security and monitoring devices and personal convenience devices are part of the IoT. So are fitness trackers, certain medical implants and computer-like devices in automobiles. The IoT is expected to expand exponentially - but new security challenges are daunting.

Which one of the following statements is the most logical and rational inference that can be made from the above passage?

A:)Development of enabling technologies in India can be a big boost to its manufacturing sector.

B:)India is not yet fully ready to adopt IoT in view of the imminent security challenges.

C:)Life becomes more comfortable with the development of cheap low-end IoT devices.

D:)As we go digital, we must recognize the huge threat to Internet security from some IoT devices.

Correct:D

Option (a) is irrelevant to the passage given. Option (b) is also irrelevant as "India" is not discussed in the passage. Option (c) is not correct as this is not the theme of this passage.

Best answer is option (d).

41.Read the following passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.

Passage

With the digital phenomenon restructuring most social sectors, it is little surprise that global trade negotiations are now eyeing the digital area in an attempt to pre-emptively colonise it. Big Data is freely collected or mined from developing countries, and converted into digital intelligence in developed countries. This intelligence begins to control different sectors and extract monopoly rents. A large foreign company providing cab service, for instance, is not a network of cars and drivers; it is digital intelligence about commuting; public transport, roads, traffic, city events, personal behavioural characteristics of commuters and drivers and so on.

Which, one of the following is the most logical and rational corollary to the above passage?

A:) Globalization is not in the interests of India as it undermines its socio-economic structures.

B:) India should be careful to protect its digital sovereignty in global trade talks.

C:) India should charge Monopoly rents from Multinational companies

in exchange for Big Data.

D:) The loss of Big Data from India is proportional to the degree/value of its foreign trade.

Correct: B

Options (a), (c) and (d) are wrong. The passage is clearly talking about how digital data ownership is now driving trade and business advantages, and how Indian data in the hands of foreign firms is not a good idea (for India). Clearly, (b) represents the best corollary (i.e. a guidance for the future).

42 Read the following passages and answer the items that follow each passage. Your answers to these items should be based on the passages only.

Passage

With the digital phenomenon restructuring most social sectors, it is little surprise that global trade negotiations are now eyeing the digital area in an attempt to pre-emptively colonise it. Big Data is freely collected or mined from developing countries, and converted into digital intelligence in developed countries. This intelligence begins to control different sectors and extract monopoly rents. A large foreign company providing cab service, for instance, is not a network of cars and drivers; it is digital intelligence about commuting; public transport, roads, traffic, city events, personal behavioural characteristics of commuters and drivers and so on.

Which of the following is most definitively implied by the above passage?

A:) Big Data is the key resource in the digital space.

B:) Big economies create Big Data.

C:) Access to Big Data is the prerogative of developed countries.

D:) Access to and possession of Big Data is a characteristic of developed countries.

Correct: A

Sol:

This is the central idea. Option (b) is a mere fact. Option (c) is wrong- the developed countries have no such right! Option (d) is not entirely correct.

Passage

43. The rural poor across the world, including India, have contributed little to human-induced climate change, yet they are on the frontline in coping with its effects. Farmers can no longer rely on historical averages for rainfall and temperature, and the more frequent and extreme weather events, such as droughts and floods, can spell disaster. And there are new threats, such as sea level rise and the impact of melting glaciers on water supply. How significant are small farms? As many as two billion people worldwide depend on them for their food and livelihood. Small-holder farmers in India produce 41 percent of the country's food grains, and other food items that contribute to local and national food security.

What is the most logical and rational corollary to the above passage.?

A:) Supporting small farmers is an important part of any agenda regarding environmentally sustainable development.

B:) Poor, countries have little role to play in the mitigation of global warming.

C:) Due to a large number of farmer households, India will not have food security problem in the foreseeable future.

D:) Only small-holder farmers in India can ensure food security.

Correct: A

Sol:

Answer is (a). Options (b), (c) and (d) are incorrect. Option (b) is wrongly interpreting the passage - the poor may not have contributed to climate change, but they may have a role in mitigating it now, Option (c) is a big assumption being made, and may be wrong. Option (d) is not mentioned anywhere thus. The use of "only" makes it wrong. Best choice is option (a).

44. The rural poor across the world, including India, have contributed little to human-induced climate change, yet they are on the frontline in coping with its effects. Farmers can no longer rely on historical averages for rainfall and temperature, and the more frequent and extreme weather events, such as droughts and floods, can spell disaster. And there are new threats, such as sea level rise and the impact of melting glaciers on water

supply. How significant are small farms? As many as two billion people worldwide 'depend on them for their food and livelihood. Small-holder farmers in India produce 41 percent of the country's food grains, and other food items that contribute to local and national food security.

The above passage implies that

1. There is a potential problem of food insecurity in India:
2. India will have to 'strengthen its disaster management capabilities.

Which of the above assumptions is/are valid ?

- A:) 1 only
- B:) 2 only
- C:) Both 1 and 2
- D:) Neither 1 nor 2

Correct:C

Both assumptions seem valid. Assumption 1 is indicated as small farms produce a lot of food, and are under threat. Assumption 2 is a clear message for India, from the tone of the passage.

45. Passage

A changing climate, and the eventual efforts of governments (however reluctant) to deal with it, could have a big impact on investors' returns. Companies that produce or use large amounts of fossil fuels will face higher taxes and regulatory burdens. Some energy producers may find it impossible to exploit their known reserves, and be left with "stranded assets" — deposits of oil and coal that have to be left in °the ground. Other industries could be affected by the economic damage caused by more extreme weather — storms, floods, heat waves and droughts.

On the basis of the above passage, the following assumptions have been made :

1. Governments and companies need to be adequately prepared to face the climate change.
2. Extreme weather events will reduce' the economic growth of governments and companies in future.
3. Ignoring climate change is a huge risk for investors.

Which of the above assumptions is/are valid?

A:)1 and 2 only

B:)3 only

C:)1 and 3 only

D:)1, 2 and 3

Correct: C

Sol:

Assumption 3 is definitely correct. So option (a) is ruled out. Assumption 2 is worded in a strange way - "economic growth of governments" does not sound right. So we reject it. So option (a) and (d) are gone. We are left with option (c) only.

46. Access to schooling for those coming of school age is close to universal, but 'recess to quality exhibits a sharp gradient with socio-economic status. Quotas for the weaker sections in private schools is a 'provision introduced by the Right of Children to Free and Compulsory Education Act, 2009. The quotas have imposed a debate on issues of social integration and equity in education that private actors had escaped by and large. The idea of egalitarian education system with equality of opportunity as its primary goal appears to be outside the space that private school principals inhabit. Therefore, the imposition of the quotas has led to resistance, sometimes justified.

With reference to the above passage, the following assumptions have been made :

1. Making equality of opportunity a: Reality is the fundamental goal of the Indian education system.
2. The present Indian school system is unable to provide egalitarian education.
3. Abolition of private schools and establishment of more government schools is the only way to ensure egalitarian education..

Which of the above assumptions is/are valid ?

A:)1 and 2 only

B:)2 only

C:)2 and 3 only

D:)3 only

Correct: B

47. A majority of the TB infected in India are poor and lack sufficient nutrition, suitable housing and have little understanding of prevention. TB then devastates families, makes the poor poorer, particularly affects women and children, and leads to ostracisation and loss of employment. The truth is that even if TB does not kill them, hunger and poverty will. Another truth is that deep-seated stigma, lack of counselling, expensive treatment' and lack of adequate support from providers and family, coupled with torturous side effects demotivate patients to continue treatment - with disastrous health consequences.

Which one of the following is the most logical, rational and crucial message conveyed by the above passage ?

A:)TB is not a curable disease in Indian circumstances.

B:)Curing TB requires more than diagnosis and medical treatment.

C:)Government's surveillance mechanism is deficient; and poor people have no access to treatment.

D:)India will be free from diseases like TB only when its poverty alleviation programmes are effectively and successfully implemented.

Correct:B

Sol:

Option (a) is wrong. It is nowhere mentioned thus, with an air of fatality: Option (c) is wrong as poor do have access to treatment though it seems to be not working out well. The phrase have no access" is wrong. Option (d) goes tangentially into a different direction. Best answer is (b).

48. All members of a club went to Mumbai and stayed in a hotel. On the first day, 80% went for shopping and 50% went for sightseeing, whereas 10% took rest in the hotel. Which of the following conclusion(s) can be drawn from the above data ?

1. 40% members went for shopping as well as sightseeing.

2. 20% members went for only shopping.

Select the correct answer using the code given below :

A:) 1 only

B:) 2 only

C:) Both 1 and 2.

D:) Neither 1 nor 2

Correct:A

Sol:

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

Let the total no. of people be 100. People who went for shopping 80% of 100 = 80 = n(A)

People went for sightseeing 50% of 100 = 50 = n(B) People who took rest 10% of 100 = 10

People who went for shopping or sightseeing or both = 100-10=90=n(AUB)

Therefore,

$$90 = 80 + 50 - n(A \cap B)$$

$$n(A \cap B) = 130 - 90$$

$$n(A \cap B) = 40$$

People who went for shopping as well as sightseeing - 40 People who went for only shopping 80 - 40 = 40

People who went for only sightseeing - 50 - 40 = 10

Conclusion 1: 40% members went for shopping as well as sightseeing. (True)

Conclusion 2: 20% members went for only shopping. (False)

Hence, option 1 is the correct answer

49. The ratio of a two-digit natural number to a number formed by reversing its digits is 4 : 7. The number of such pair is

A:)5

B:)4

C:)3

D:)2

Correct:B

Sol:

Let the ten's digit of two digit number ab be 'a' and unit's digit be 'b'. So the number will be of the form 10a+b

After reversing the digits the number will be 10b+a.

By the condition given in question we have $(10a+b)/(10b+a)=4/7$ which means

$a/b=1/2$ So by putting the values, total possible pairs (12, 21), (24, 42), (36, 63), (48, 84).

Thus, four pairs are possible.

Ans.(b)

50. Ena was born 4 years. after her parents' marriage. Her mother is three years younger than her father and 24 years older than Ena, who is 13. years old. At what age did Ena's father get married ?

A:)22 years

B:)23 years

C:)24 years

D:)25 years

Correct:B

Sol:

Ena's present age = 13

Ena's mother's present age = $13 + 24 = 37$.

Ena's father's present age = $37 + 3 = 40$.

Now at present Ena is 13 years old and her parents got married 4 years before she was born.

So, Ena's parents got married $13 + 4 = 17$ years earlier.

So at the time of marriage her father would be of $40 - 17 = 23$ years old. Ans.(b)

51. In a group of 15 people; 7 can read French, 8 can read English while 3 of them can read neither of these two languages. The number of people who can read exactly one language is

A:)10

B:)9

C:)4

D:)5

Correct:B

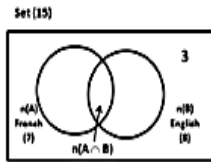
Sol:

This is a question from Set Theory. In a group of 15 people 3 cannot read any of two languages.

So, $n(A \cup B) = 12$, $n(A) = 7$, $n(B) = 8$. And we have $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ By putting the values, we have $12 = 7 + 8 - n(A \cap B)$.

So, $n(A \cap B) = 3$.

So, total number of people who can read exactly one language = $(7 - 3) + (8 - 3) = 4 + 5 = 9$. Following Venn Diagram can help you understand the case -



Ans.(b)

52.What is X in the sequence 132, 129, 124, 117, 106, 93, X ?

A:)74

B:)75

C:)76

D:)77

Correct:C

Sol:

The series is reducing by 3, 5, 7, 11, 13... Le., by prime numbers starting with 3. So, the next prime will be 17. The value of X will be $93 - 17 = 76$.

Ans.(c)

53. Consider the following sequence that follows some arrangement c_accaa_aa_bc_b

The letters that appear in the gaps are

A:) abba

B:) cbbb

C:)bbbb

D:)Cccc

Correct:B

Sol:

There are 15 characters in the sequence. So we should find sequences of 5 characters each in it. By applying the options given, we find that correct sequence is ccacc aabaa bbcb when we use option (b)-c-b-b-b.

54. Number 136 is added to 5B7 and the sum obtained is 7A3, where A and B are integers. It is given that 7A3 is exactly divisible by 3. The only possible value of B is

A:) 2

B:) 5

C:) 7

D:) 8

Correct:D

It is given $136+5B7=7A3$.

Add the unit's numbers to get $6+7=13$. So, carry over 1.

$\Rightarrow 1+3+B=1A \Rightarrow 1+3+B=10+A \Rightarrow B-A=6$.

Which means if $A=0$, $B=6$; if $A=1$, $B=7$, if $A=2$, $B=8$ and if $A=3$, $B=9$.

But given 7A3 is completely divisible by 3. So, as per rules of divisibility, $7+A+3=10+A$ should also be completely divisible by 3.

So the possible values of A are 2, 5 and 8. (12/15/18 divisible by 3) Out of these, only 2 satisfies both the conditions so $A=2$, so $B=8$. Ans.(d)

55. If every alternative letter of the English alphabet from B onwards (including B) is written in lower case (small letters) and the remaining letters are capitalized, then how is the first month of the second half of the year written ?

A:) JuLY

B:) jULy

C:) jUly

D:) jUIY

Correct:D

Sol:

If we will write the English alphabet as described in the question we will get the 26 letters as AbCdEfGhIjKlMnOpQrStUvWxYz. So, July will be written july.

To do this mentally, break up the 26 alphabets into 13 pairs of two alphabets each - ab, cd, ef, yz. Then, mentally visualize them to become Ab, Cd, Ef,... Yz. Then July will have y at the end. That is capital Y. So options (b) and (c) are ruled out. And alphabet j will be in small caps. So (a) is ruled out. So answer is option (d).

56. A joint family consists of seven members A, B, C, D, E, F and G with three females. G is a widow and sister-in-law of D's father F. B and D are siblings and A is daughter of B. C is cousin of B. Who is E ?

1. Wife of F'
2. Grandmother of A
3. Aunt of C

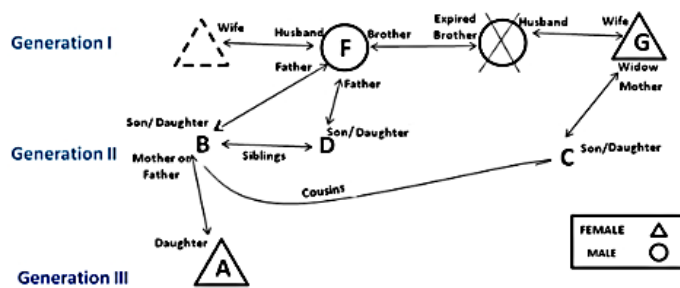
Select the correct answer using the code given below :

- (a) I and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Correct:D

Sol:

Sol. Answer is (d). All are correct – E is the wife of F, grandmother of A, and aunt of C. The information given in question can be interpreted by the diagram shown –



Hence answer is (d).

57. Each face of a cube can be painted in black or white colours. In how many different ways can the cube be painted ?

- A:) 9
- B:) 10
- C:) 11
- D:) 12

Correct:B

Sol:

Sol. Answer is (b). There are many cases possible. Basic assumption is that all faces are identical and not identified by different numbers.

Case I: All the faces are painted black. ONE case.

Case II: Five faces are painted black and one face is painted white. ONE case (Since cube is symmetrical figure on all its faces, that is why six cases will reduce to ONE)

Case III: Four faces are painted black and two faces are painted white. Two cases. First when the two white faces are on opposite faces and second when the two white faces are on adjacent faces.

Case IV: Three faces are painted black and three faces are painted white. Two cases. This can be done in two ways

Case V: Two faces are painted black and four faces are painted white. Similar to case III. Two cases. First when the two white faces are on opposite

faces and second when the two white faces are on adjacent faces,

Case VI: One face is painted black and five faces are painted white. Similar to case II. ONE case (Since cube is symmetrical figure on all its faces that is why six cases will reduce to ONE)

Case VII: All the faces are painted white. ONE case.

So, total $1+1+2+2+2+1+1=10$ cases are possible.

A simpler way to look at it will be

0 sides White: 1 way (all sides Black)

1 side White: 1 way (all other sides Black)

2 sides White: 2 ways (1 way with adjacent sides White, and 1 way with opposite sides White)

3 sides White 12 ways (1 way where three White sides have same corner, and 1 way where opposite sides are White and one center side is White)

4 sides White: 2 ways (same as 2 sides Black)

5 sides White: 1 way (same as 1 side Black)

6 sides White: 1 way (same as 0 sides Black)

So total $1+1+2+2+2+1+1=10$ ways.

Passage-1

In India, over the last decade or so, labour has been departing agriculture, but is only going to construction and unregistered manufacturing which are not markedly better jobs. Services, Where labour tends to be most productive, are not generating the additional jobs the country needs. India will need 24 million or so jobs over the next decade. The new sector, e-commerce, can at best close only half the jobs gap. Only those sectors that drive domestic demand such " as health and education can comfortably fill the other half.

58. Which one of the following is best implied in the passage?

- A:) Strong measures need to be taken to reduce the rural to urban migration of labour.
- B:) The working condition in construction and unregistered manufacturing needs to be improved.
- C:) Service sector has been reducing the problem of unemployment.
- D:) Increased social sector spending is imperative for large-scale job creation.

Correct: D

Sol:

Theme is "Jobs in India".

Clearly option (d) is the answer.

Option (a) is wrong as the passage does not talk about reducing labour movement out of rural areas.

Option (b) is wrong as that is not the core idea in the passage ("best implied")

Option (c) is just opposite to what is given and is evident from Services, where labour tends to be most productive, are not generating the additional jobs the country needs. It is given that Only those sectors that drive domestic demand such as health and education (social sector) can comfortably fill other half so id) is true,

Option (d) is slightly indirect but ultimately means what is being asked. Health and education sectors comprise the social sector, and large investments there can generate many jobs.

59. In India, the current focus on the right to privacy_ is based on some new realities of the digital age. A right is a substantive right only if it works in all situations, and for everyone. A right to free expression for an individual about her exploitation, for instance, is meaningless without actual availability of security that guarantees that private force cannot be used to thwart this right. The role of the State, therefore, is not just to abstain from preventing rightful free expression, but also to actively ensure that private parties are not able to block it.

On the basis of the above passage, the following assumptions have been made :

1. State should have some institutions to ensure its appropriate role in a digital society.
2. State should ensure that private parties do not violate the citizens' right to privacy.
3. Digital economy is not compatible with the idea of not violating the citizens' privacy.

Which of the above assumptions is/are valid?

- A:) 1 and 2
- B:) 3 only
- C:) 1 and 3
- D:) 2 only

Correct:A

Sol:

Theme is "Rights of Citizens in 21st century".

Statement 3 is clearly wrong, as it is not assumed anywhere in the passage. So options (b) and (c) are ruled out

Look at the options - we need to just check if Statement 1 is right or not. It is indeed correct because to actively ensure is possible only through institutional mechanisms (not one-off or ad hoc responses). Hence only (a) seems correct.

The passage talks about right to privacy, then it provides insight on meaningfulness of right with an example on right to free expression. At the end of the passage there is mention of role of state' in ensuring the right to free expression through acts of omission and commission.

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Passage-3

60. One of the biggest ironies around water is that it comes from rivers and other wetlands. Yet it is seen as divorced from them. While water is used as a resource, public policy does not always grasp that it is a part of the natural ecosystem. Efforts at engineering water systems are thus efforts at augmenting water supply rather than strengthening the capacities of ecological systems.

Which one of the following is the most logical and rational inference that can be made from the above passage?

- A:) Rivers and other wetlands should be protected under Ramsar Convention.
- B:) Engineering water systems should be modernized and further augmented.
- C:) Wetlands need to be reinforced as more than just open sources of water.
- D:) Water supply should not be free of cost so as to prevent its misuse or overuse.

Correct:C

Theme is "Water as a resource".

Passage does not talk about 'Ramsar Convention' neither does it talk about 'cost of its supply, so options (a) and (d) are ruled out

Passage talks about strengthening the capacities of ecological systems. For this you have to give more respect to the wetlands, from where the water is sourced, and that can be done by considering them more than just open sources of water. So option (c) is correct.

Option (b) is not the most logical inference as modernization of water systems does not necessarily mean respecting natural ecosystems.

Passage-4

61. Asset allocation is the most important investment decision we will ever make, and sadly, most of us do not give that decision the importance it deserves. We are adamant about seeking predictability with our future. We tend to think of investing in risky assets as extremely volatile and value eroding. We also dislike fluctuating returns and the loss of control of investment. We think our money is

best left idle, unproductive but safe. There is no asset that is risk-free. We could lose our jobs, our homes can lose value, our banks can go bankrupt, our bonds can default, the government can collapse and companies we chose fondly may cease to exist. But we cannot live life assuming that all these extreme events are waiting to happen, and all at the same time. All these extreme forms of risks we know will not manifest at the same time.

Which one of the following statements best implies the suggestion given by the author of the passage?

- A:) Distribute your wealth across different kinds of assets so that your risks would be minimized.
- B:) Risk-taking behaviour should be a necessary component of your personality if you want to generate wealth.
- C:) While making investments, find a trustworthy asset management organization which would manage your wealth for you.
- D:) You should know that investing your money is a risky business.

Correct:A

Sol:

Theme is "Investment and Asset Allocation".

The word 'Asset allocation itself means the implementation of an investment strategy that attempts to balance risk versus reward by adjusting the percentage of each asset in an investment portfolio according to the investor's risk tolerance, goals and investment come frame

Option (c) can be eliminated as that's not mentioned anywhere.

Option (d) is worded rather loosely and can be eliminated.

Option (b) would be eliminated due to the words "to generate wealth".

We are left with Option (a) now. At the end, the passage talks about diversifying the assets for lower risk all these extreme forms of risks we know will not manifest at the same time).

Passage is not talking about risk-taking but to diversify the risk and there is no mention of asset management organisation.

IAS Academy by IAS Officers
Passage-5

62. Although most of the Genetically Modified (GM) crops cultivated now are genetically engineered for a single trait, in future, crops genetically engineered for more than one trait will be the norm. Thus, biotechnology's role in agriculture and the regulation of the same cannot be understood solely in the context of the current generation of GM crops. Instead, there is a need to take a comprehensive look, taking into account various aspects, including socio-economic impacts, so that the potential of the technology can be harnessed while minimizing negative impacts. Given the importance of biotechnology in developing varieties that can help in climate change mitigation and adaptation, not using biotechnology as a part of the climate change action plan cannot be an option. Domestic regulation of biotechnology cannot be viewed in isolation of trade policy and obligations under various international treaties and conventions.

With reference to the above passage, the following assumptions have been made :

1. Biotechnology regulation is an evolving process.
2. Participation of people is needed in policy decisions regarding biotechnology regulation.
3. Biotechnology regulation should take into account socio-economic aspects in decision-making.
4. Wider involvement of political executive in biotechnology regulation improves its effectiveness in dealing with the country's trade policies and international obligations.

Which of the above assumptions are valid?

- A:) 1, 2 and 4 only
B:) 1 and 3 only
C:) 2, 3 and 4 only
D:) 1, 2, 3 and 4

Correct: B

63. How many zeroes are there at the end of the following product?

$$1 \times 5 \times 10 \times 15 \times 20 \times 25 \times 30 \\ \times 35 \times 40 \times 45 \times 50 \times 55 \times 60$$

A:)10

B:)12

C:)14

D:)15

Correct: A

Sol:

In a multiplication problem, 0 can be produced in two ways. First when a number is multiplied by 10 or second when 5 is multiplied by 2 or any even number.

So to count the number of zeroes in the given multiple let's break the whole multiplication in to 10, 5 and 2.

We get $1 \times 5 \times 10 \times 15 \times 20 \times 25 \times 30 \times 35 \times 40 \times 45 \times 50 \times 55 \times 60$

$$= 1 \times 5 \times 10 \times (3 \times 5) \times (2 \times 10) \times (5 \times 5) \times (3 \times 10) \times (7 \times 5) \times (4 \times 10) \times (9 \times 5) \times (5 \times 10) \times (11 \times 5) \times (6 \times 10)$$

$$= 1 \times (10 \times 10 \times 10 \times 10 \times 10 \times 10) \times (5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5) \times (2 \times 4 \times 6) \times (3 \times 3 \times 7 \times 9 \times 11)$$

$$= 1 \times (10 \times 10 \times 10 \times 10 \times 10 \times 10) \times (5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5) \times \{2 \times (2 \times 2) \times (2 \times 3)\} \times (3 \times 3 \times 7 \times 9 \times 11)$$

Now you can see in above multiplication we have six 10s, eight 5s and four 2s.

Six 10s will give us six 0s while four 2s when combined with four 5s (out of the eight available) will give us additional four 0s.

So in the multiplication six + four = ten 0s will be there.

[An easy question based on number systems, that required some factoring to reach the final answer. If you can it quickly, then attempt this in the first round, else wait till you have solved all easier ones first.]

64. Let XYZ be a three-digit number, where $(X + Y + Z)$ is not a multiple of 3. Then $(XYZ + YZX + ZXY)$ is not divisible by

A:)3

B:)9

C:)37

D:) $(X + Y + Z)$

Correct:B

Sol. Ans.(b).

XYZ is a 3-digit number not divisible by 3.

We know that expanded form of XYZ will be $100X + 10Y + Z$. (basic decimal number system)

$$\begin{aligned} \text{So, } XYZ + YZX + ZXY &= (100X + 10Y + Z) + (100Y + 10Z + X) + (100Z + 10X + Y) \\ &= 111X + 111Y + 111Z = 111(X + Y + Z) \end{aligned}$$

(note 3 and 37 are prime numbers and $X + Y + Z$ is not a multiple of 3 (given), so it will not be multiple of 9 too)

So, the correct option is (b).

[A tough question based on properties of numbers, and can be avoided.]

65. If you have two straight sticks of length 7.5 feet and 3.25 feet, what is the minimum length can you measure?

A:)0.05 foot

B:)0.25 foot

C:)1 foot

D:)3.25 feet

Correct:B

Sol:

When we have to measure the "minimum length, it is the length common to both the given sticks. So it will be the HCF.

Correct answer is HCF of 7.5 and 3.25, which is 0.25

How to calculate? Find the HCF of 750 and 325, and then put decimal point appropriately)

66. Consider the following data

	Average Marks in English	Average marks in Hindi
Girls	9	8
Boys	8	7
Overall average marks	8.8	x

What is the value of x in the above table?

A:) 7.8

B:) 7.6

C:) 7.4

D:) 7.2

Correct: A

Let the number of boys = b and number of girls = g.

So by the condition given in question we have $98 - 8b - 8.8(b + g)$. That gives us ratio bg 1:4.

It means that if there are p boys number girls will be 4p, where p is any positive integer.

Again by the condition given in question $8 \times 4p + 7p = X(4p + p)$

$\Rightarrow 32p + 7p = 5pX \Rightarrow 39p = 5pX \Rightarrow 39 = 5X$ or $X = 39/5$ or $X = 7.8$,

(A question base on Averages. Not so easy. Avoid it (at least in the first round of solving

67. A family of two generations consisting of six members P, Q, R, S, T and U has three males and three females. There are two married couples and two unmarried siblings. U is P's daughter and Q is R's mother-in-law. T is an unmarried male and S is a male. Which one of the following is correct?

A:) R is U's husband.

B:) R is S's wife.

C:) S is unmarried.

D:) None of the above

Correct: B

Sol:

Given-1. Two generations; 2. Six members P, Q, R, S, T and U. Three males, and three females. Two married couples (which means out of these four two will be male and two will be female). Two unmarried siblings..

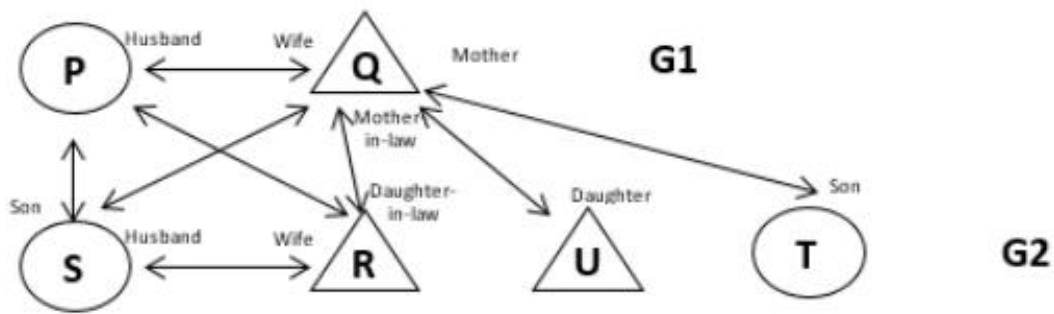
Logical Conclusions-Out of two unmarried siblings one will be male and one will be female.

There are only two generations. Let the older generation be G1 and younger generation be G2.

P and Q will be part of G1 because of being a parent and mother-in-law.

U, R and T (unmarried male) will be part of G2.

Considering all the information we can get following order (circle representing male and triangle representing female



68. Two Statements S1 and S2 are given below followed by a Question :

S1 : n is a prime number.

S2 : n leaves a remainder of 1 when divided by 4.

Question :

If n is a unique natural number between 10 and 20, then what is n ?

Which one of the following is correct in respect of the above Statements and the Question?

- A:) S1 alone is sufficient to answer the Question.
- B:) S2 alone is sufficient to answer the Question.
- C:) S1 and S2 together are sufficient to answer the Question, but neither S_i alone nor S2 alone is sufficient to answer the Question.
- D:) S1 and S2 together are not sufficient to answer the Question.

Correct: D

Sol:

Neither of the S1 and S2 together or alone can give you the value of n .

Using S1 alone you have four prime numbers between 10 and 20 \rightarrow 11, 13, 17, and 19.

Using S2 alone there are two numbers 13 ($= 4 \times 3 + 1$) and 17 ($= 4 \times 4 + 1$) are possible.

Even after combining both you will get set of two numbers i.e., 13 and 17. So correct answer is option (d).

69. Two Statements S₁ and S₂ are given below with regard to two numbers followed by a Question :

S₁ : Their product is 21.

S₂ : Their sum is 10.

Question :

What are the two numbers?

Which one of the following is correct in respect of the above Statements and the Question?

A:) S₁ alone is sufficient to answer the Question.

B:) S₂ alone is sufficient to answer the Question.

C:) S₁ and S₂ together are sufficient to answer the Question, but neither S₁ alone nor S₂ alone is sufficient to answer the Question.

D:) S₁ and S₂ together are not sufficient to answer the Question.

Correct:C

Sol:

S₁ alone gives you $a \times b = 21$ (where a and b are two numbers) which have multiple possibilities like $3 \times 7 = 21$, $1.5 \times 14 = 21$ or $6 \times 3.5 = 21$. (it is not mentioned that numbers are integers)

So S₁ alone is not sufficient.

S₂ alone will also not sufficient as it will give you $a + b = 10$, and again multiple possibilities of a and b like (1, 9); (2, 8); (3, 7) etc.

By combining both we have $a + b = 10$ or $b = 10 - a$ (1) and $a \times b = 21$ (2)

Putting the value of b in equation 2, we have $a(10 - a) = 21$ $a^2 - 10a + 21 = 0$

$\Rightarrow a^2 - 7a - 3a + 21 = 0 \Rightarrow a(a - 7) - 3(a - 7) = 0 \Rightarrow (a - 7)(a - 3) = 0$

\Rightarrow If $a = 7$, $b = 3$ and If $a = 3$, $b = 7$.

So both S₁ and S₂ are required to find the numbers. Option (c) is correct.

(A moderately tough question based on Data Sufficiency logic. May be tried)

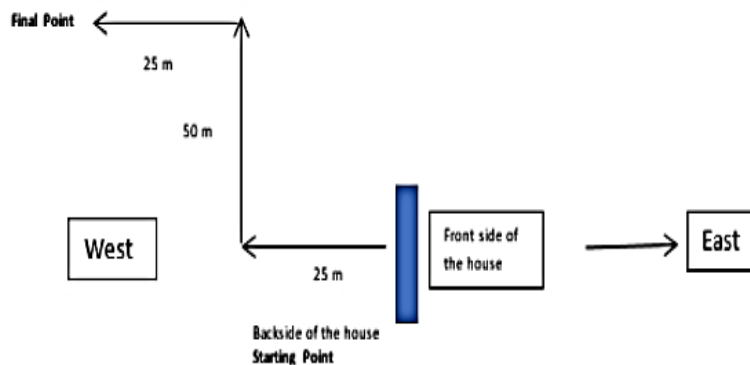
70. A man walks down the backside of his house straight 25 metres, then turns to the right and walks 50 metres again; then he turns towards left and again walks 25 metres. If his house faces to the East, what is his direction from the starting point?

- A:) South-East
- B:) South-West
- C:) North-East
- D:) North-West

Correct: D

Sol:

Sol. Ans.(d). Here is the diagram representing the movement –



From the diagram given above, it is clear that he will be in North-West direction from the starting point.

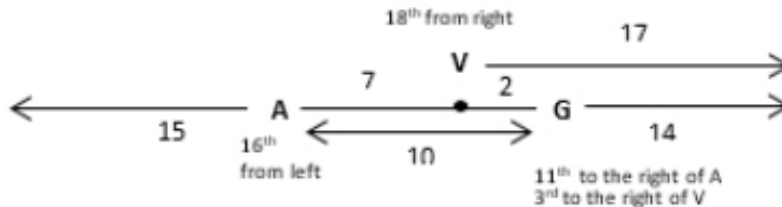
[A simple Directions based question. Must be done.]

71. A is 16th from the left end in a row of boys and V is 18th from the right end. G is 11th from A towards the right and 3rd from V towards the right end. How many boys are there in the row?

- A:) 40
 B:) 41
 C:) 42
 D:) Cannot be determined due to insufficient data

Correct: B

Sol. Ans.(b). Refer to the diagram given below.



A is 16th from left so 15 students will be there to A's left. G is 11th to right from A and 3rd to right from V. So there will be 7 students between A and V and 2 students between V and G. Consequently there will be 14 students to the right of G. So total number of Students will $15 + 7 + 2 + 14 + A(1) + V(1) + G(1) = 41$.

[A slightly tricky question based on seating arrangements. Can be done but may take some extra time to do carefully. Think and decide!]

72. The average age of a teacher and three students is 20 years. If all the three students are of same age and the difference between the age of the teacher and each student is 20 years, then what is the age of the teacher?

- A:) 25 years
 B:) 30 years
 C:) 35 years
 D:) 45 years

Correct: C

Sol:

Traditional Method Let the age of Teachers is T years and the three students is a years (Given age of all three student is same). Then according to the information given in question we have $(T+ 3a)/4=20$ or $T+ 3a = 80$ (1)

T-a 20 (2) (assuming that teachers age will be greater than the students)

By solving equations 1 and 2 simultaneously we have a 15 and T-35. Option (c) is correct.

Working backward from options method:

Option (a)-If teacher's age is 25 years, then students' age would be 5 years (assuming that teachers age will be greater than the students). This will give average of teacher and students age to $(25-3-5)/4=10$. Hence it is not correct.

Option (b)- If teacher's age is 30 years, then students age would be 10 years (assuming that teachers age will be greater than the students). This will give average of teacher and students age to $(30+ 3-10)/4=15$. Hence it is not correct.

Option (c)- If teacher's age is 35 years, then students age would be 15 years (assuming that teachers age will be greater than the students). This will give average of teacher and students age to $(35-3-15)/4=20$. This matches the information given in question. Hence it is the correct answer.

No need to check option (d).

[Averages based question. Not too easy. To be avoided in the first round]

73. A person bought a car and sold it for 3,00,000. If he incurred a loss of 20%, then how much did he spend to buy the car?

A:) ₹3,60,000

B:) ₹3,65,000

C:) ₹ 3,70,000

D:) ₹3,75,000

Correct: D

Sol. Ans.(d).

Traditional Method –

SP = Rs 3,00,000; Loss% = 20%.

CP = $(SP \times 100)/(100 - \text{Loss}\%)$

=>P = $3,00,000 \times 100 / 80$ =>CP = Rs. 3, 75,000. So, option D is correct.

Alternative method – Since loss is 20%, so 80% of CP = 3,00,000. => 0.8 CP = 300000 So CP = 3,75,000.

[A very direct question based on Profit and Loss. Must be attempted!]

Passage-1

74. Spanish ships in the late 16th century first brought the potato tuber from South America to Europe whereby in the early 19th century, it had become a reliable backup to cereal crops, particularly in the cold, rain-soaked soils of Ireland. The Irish were soon almost wholly dependent on the potato as their staple food. And they were planting primarily one prodigious variety, the 'lumper' potato, whose genetic frailty would be cruelly exposed by the fungus *Thytophthora infestans*. In 1845, spores of the deadly fungus began spreading across the country, destroying nearly all the Lumpers in its path. The resulting famine killed or displaced millions.

Which one of the following statements best reflects the critical message of the passage?

- A:) For introducing any foreign plant into a country, the soil and climate conditions of that country should be suitable.
- B:) As a staple food of a country, tuber crops like potato cannot replace cereal crops.
- C:) Some of the fungal infections of plants cannot be prevented or stopped from spreading across large areas.
- D:) Relying on a homogeneous food source is not desirable.

Correct: D

Sol:

Theme is "Crop dependence of nations"

Soil and climate conditions were not the reasons for destruction of the homogenous potato crop throughout Ireland. Soil and climate conditions were not the reasons for destruction of the homogenous potato crop throughout Ireland.

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The passage does not talk about prevention of fungal infections, so (c) is not correct. Passage does not even talk about whether the tuber crops can replace the cereal crops or not, so (b) is not correct. Passage gives the fundamental, critically important message that "do not rely on a homogenous food source else a single disease can wipe out the entire food economy".

(An easy question that must be attempted.)

Passage-2

75. India is at once among the fastest growing global economies and home to the largest number of malnourished children in the world. There are regions where malnutrition is not the exception but the norm. And across the country, malnutrition is the cause of death for roughly half the 1.3 million children who die before their fifth birthday each year. Even those children who survive suffer permanently from the damage that has already been done to their bodies and minds from not getting enough of the right foods and nutrients. Around 44 million children under 5 are stunted. That makes it harder for them to learn in school and subsequently earn a living as adults. Their lifetime earnings potential is almost a quarter less than that of their healthy peers.

With reference to the above passage, which of the following is/are the most rational and practical implication/ implications?

1. India's Public Distribution System should be monitored by the Union Government.
2. Girls should be encouraged to delay marriage and first pregnancy.
3. Mothers should be encouraged to breastfeed their children immediately after birth.
4. The supply of safe drinking water and proper sanitation facilities to all should be ensured.
5. Authorities should ensure the vaccination as prescribed.

Select the correct answer using the code given below.

- A:) 1, 2, 3 and 4
B:) 2, 3, 4 and 5
C:) 1 only
D:) 3 and 5 only

Correct: C

Sol:

Theme is "Malnutrition in India".

A very tricky question. Note that the passage is focused solely on "malnutrition" and no other topic at all-neither vaccination, nor water/sanitation nor breastfeeding, etc.

Hence, of all the statements given, if we have to focus on malnutrition alone, then it means food supply for all citizens, especially the weaker sections. And that means a better PDS system. Only statement 1 fits. If the Union govt, can monitor the PDS from the perspective of eliminating malnutrition, then the problem can be mitigated.

Statement 5 is not mentioned, so options (b) and (d) are eliminated.

And option (a) is eliminated due to 2 not being relevant instantly.

A tricky question that needs some deep thinking)

Passage-3

76. The pulse variety Pusa Arhar 16' has the potential to be grown in the paddy-growing regions of Punjab, Haryana and Uttar Pradesh and eventually in all of India. Its yield (about 2000 kg/hectare) will be significantly greater than those of the existing varieties and because its size will be uniform, it will be amenable to mechanical harvesting, an attractive feature for farmers in northern India who currently use this technology for paddy. Most important, Arhar straw, unlike paddy straw, is green and can be ploughed back into the soil. In paddy straw, the problem is the high silica content, which does not allow for easy decomposition. In the case of Arhar, the farmer, even after combine harvesting, just needs to run a rotovator to cut the leftover straw into pieces, which can be ploughed back and will decompose very fast. All this is difficult with leftover paddy stalks that cannot be easily salvaged or ploughed back. Farmers, therefore, choose the easiest option of simply burning it.

Which of the following are the most rational inferences that can be made from the passage?

1. Farmers' income will be higher with pulse cultivation, than with paddy cultivation.
2. Pulse cultivation causes less pollution as compared to paddy cultivation.
3. Pulse straw can be used to improve soil quality.
4. In the context of northern Indian agriculture, paddy straw has no usefulness.

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5. Mechanized agriculture is the main cause for stubble burning.

Select the correct answer using the code given below.

A:) 2, 3 and 5

B:) 1, 4 and 5

C:) 2 and 3 only

D:) 1 and 4 only

Correct: C

Theme is "Paddy versus Pulses in North Indian farms"

Statement 5 is not correct as it is mentioned that paddy stalks are tough to collect or plough back into the ground, hence farmers choose to burn them (so its not mechanized agriculture that's the culprit).

So options (a) and (b) are ruled out.

Now, statement 1 is not correct as we do not know really whether a direct comparison of pulse cultivation and paddy cultivation is even possible.

It's not explicitly mentioned.

So options (b) and (d) are ruled out.

So finally we are left with option (c), which is 2 and 3 only.

A not so easy question, handle with care

Passage-4

77. In India, authorities always look to store the maximum amount of water in reservoirs during the monsoon season, which is then used for irrigation and generation of electricity during the summer months. It is an internationally accepted practice that the water level of a reservoir should be kept below a certain level before the onset of monsoon season. This is so that when monsoon rains come, there is space to store the excess rainwater and also so that water can be released in a regulated manner. But the authorities store the maximum amount of water in reservoirs even before the close of the monsoon, only to ensure greater electricity generation and irrigation.

With reference to the above passage, the following assumptions have been made :

1. High risks involved in holding maximum water in reservoirs are due to our over-dependence on hydropower projects.

2. Storage capacity of dams should not be fully used before or during monsoon season.

3. Role of dams in flood control is underestimated in India.

Which of the above assumptions is/are valid?

A:) 1 and 2 only

B:) 2 only

C:) 3 only

D:) 1,2 and 3

Correct: C

Sol:

Theme is "Water reservoirs and monsoon"

Three options have statement 2 in them. So focus on 2 first.

Statement 2 says - "Storage capacity of dams should not be fully used before or during monsoon season". But the passage says that reservoirs must be used during monsoon rains to store excess rainwater. So statement 2 does not seem right.

Hence, only option (c) is correct.

(A very easy question, is solved using options)

78. What is the largest number among the following

A:) $\left(\frac{1}{2}\right)^{-6}$

B:) $\left(\frac{1}{4}\right)^{-3}$

C:) $\left(\frac{1}{3}\right)^{-4}$

D:) $\left(\frac{1}{6}\right)^{-2}$

Correct:C

Sol:

$$(1/2)^{-6} = 64;$$

$$(1/4)^{-3} = 64;$$

$$(1/3)^{-4} = 81;$$

$$(1/6)^{-2} = 36;$$

So the correct option is (c).

[All you have to do is take the denominator to the numerator.]

79. What is the greatest length x such that $3\frac{1}{2}$ m and $8\frac{3}{4}$ m are integral multiples of x ?

A:) $1\frac{1}{2}$ m

B:) $1\frac{1}{3}$ m

C:) $1\frac{1}{4}$ m

D:) $1\frac{3}{4}$ m

Correct:D

Sol. Ans.(d).

We have to basically find the HCF of $3\frac{1}{2}$ and $8\frac{3}{4}$.

$$3\frac{1}{2} = \frac{7}{2} \text{ and } 8\frac{3}{4} = \frac{35}{4}.$$

So we have to find HCF of $\frac{7}{2}$ and $\frac{35}{4}$.

$$\text{HCF of fractions} = \frac{\text{HCF of Numerators}}{\text{LCM of Denominators}} = \frac{\text{HCF of 7 and 35}}{\text{LCM of 2 and 4}} = \frac{7}{4} = 1\frac{3}{4}$$

Alternate method –

Here $X \times \text{Integer} = 3\frac{1}{2}$ and $X \times \text{Integer} = 8\frac{3}{4}$.

So $\text{Integer} = 3\frac{1}{2} / X$.

Working backward from options $3\frac{1}{2} / 1\frac{1}{2}$ is not an Integer. So option (a) is not possible.

Similarly, options (b) and (c) are not possible.

For option (d), $3\frac{1}{2} / 1\frac{3}{4} = 2$ and $8\frac{3}{4} / 1\frac{3}{4} = 5$. So the correct option is (d).

[A good question based on HCF/LCM that can be done directly using options.]

80. A vessel full of water weighs 40 kg. If it is one-third filled, its weight becomes 20 kg.

What is the weight of the empty vessel?

A:) 10KG

B:) 15KG

C:) 20KG

D:) 25KG

Correct: A

Regular method: Let the weight of empty vessel = v and weight of water = w , then by the conditions given we have

$$v + w = 40 \dots (1) \text{ and}$$

$$v + w/3 = 20 \dots (2)$$

By solving equations (1) and (2) simultaneously we have $w = 30$ and $v = 10$.

Short-cut: Taking option (a), weight of empty vessel = 10, so weight of water when vessel is completely filled = $40 - 10 = 30$. When water is one-third fill its weight = $30/3 = 10$. So weight of vessel when one-third filled with water = $10 + 10 = 20$. Which matches with the condition given in question. So answer is option (a).

[Short-cut method is much better here]