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CREATING CIVIL SERVANTS FOR THE NATION

Answer Keys & Explanations of UPSC CSE Prelims 2020

GS - II

Private investment in general is volatile. Foreign private investment is more volatile because the available investment avenues are significantly greater (i.e., the entire world). Therefore, the responsibility of providing employment cannot be left to Foreign District Investment (FDI). The current FDI inflows are volatile over time and across sectors and regions, which is a necessary consequence of their search for the highest returns. The adverse consequences are unstable employment and an accentuation of income and regional inequalities. A probable positive consequence of foreign investment is the inflow of new technology and its subsequent diffusion. However, the technology diffusion is not at all certain because the existing state of physical and human capital in India may prove inadequate for the diffusion.

1. With reference to the above passage, the following assumptions have been made:
1. Relying on foreign investment in the long run is not an economically sound policy.
2. Policies must be undertaken to reduce volatility in foreign private investment.
3. Policies must be undertaken to strengthen domestic private investment.
4. Public investment should be given priority over private investment.
5. Substantial public investment in education and health should be undertaken.
Which of the above assumptions is/are valid?
(a) 1, 2 and 4
(b) 1, 3 and 5
(c) 2, 4 and 5
(d) 3 only

Ans: B
Statement 1 is correct assumption as it is clearly written in the passage that foreign investment is more volatile, so we not relying on foreign investment, in the long run, makes sense.
Statement 2 is wrong since it is nowhere mentioned that the state has the ability to reduce the volatility in foreign investment.
Statement 3 is correct as the state cannot rely on foreign private investment, it might try to strengthen the domestic private investment.
Statement 4 seems to be correct as it is clearly mentioned in the passage that private investment is volatile.
Statement 5 also seems correct as it speaks about public investment in some sectors.
As statement 2 is wrong, option a and c are eliminated. So the only that fits is (b).

Passage – 2

Many opportunities to harness the highly skewed, seasonal and spatial distribution of monsoon flows, which occur in a four-month period from June to September annually, have been lost. Since these few months account for most of the rainfall and consequent freshwater availability, the need for holding rainwater in reservoirs, for subsequently releasing it for use over the year, is a necessity nobody can afford to overlook. Climate change will continue to affect weather conditions and create water shortages and excesses. While millions suffer from droughts and floods, waters in the country's many rivers flow unutilized, and are discharged into the sea every year.

2. With reference to the above passage, which of the following could be the most rational and practical implications for India?
1. Inter-linking of rivers should be undertaken.
2. A network of dams and canals should be built across the country for proper distribution of water.
3. Farmers should be provided easy loans for digging borewells.
4. Usage of water for agriculture should be regulated by law.
5. Distribution of river water among regions should be regulated by the Union Government.
Select the correct answer using the code given below.
(a) 1 and 2
(b) 2, 4 and 5
(c) 1, 3 and 4
(d) 2, 3 and 5

Ans: A
Statement 1 is correct as this step tries to efficiently utilise the water available in the rivers.
Statement 2 is correct as this measure distributes water across the country avoiding the condition of drought, as it is implied in the last sentence that millions suffer from droughts.

Statement 3 is incorrect as digging borewells cannot utilise the monsoon water and the passage does not talk about the ability of farmers in taking loans for digging borewells.
Statement 4 is incorrect because the passage does not make any reference to the regulation of water used for agriculture.
Statement 5 is incorrect as the passage does not refer to how the water is distributed among different regions or states.

Passage – 3

People will invest in education whenever they are granted the economic freedom to fully enjoy its benefits. Again, this is for the obvious reason that the return on education increases as the level of economic freedom rises. When people, thanks to lower tax rates, are allowed to retain most of the higher income that they gain from each incremental level of education, it makes eminent sense to invest in education. On the other hand, when the government decides to tax the higher income of educated individuals at even higher rates, it makes very little sense to invest in educating oneself further. The same incentives apply to parents who decide on whether to invest in their children's education.

3. Which references to the above passage, the following assumptions have been made:
1. Lower tax rates in a country invariably translate into greater investments in higher education.
2. Investment in the education of children ensures their economic freedom.
3. Economic freedom has a positive impact on building up human capital.
Which of the above assumptions is/are valid?
(a) 1 only
(b) 2 only
(c) 3 only
(d) 1, 2 and 3

Ans: C
Statement 1 is incorrect: Lower tax rates might lead to greater investments in higher education. But it cannot be told for sure. The word 'invariably' is an extreme word here giving the meaning of always.
Statement 2 is incorrect: The passage tells us that economic freedom ensures investment in education, it is not that investment in education ensures economic freedom.
Statement 3 is correct: Since economic freedom can lead to investment in education, it can lead to the building up of human capital.

Passage – 4

Our urban bodies cannot possibly ensure sustainable delivery of water in our cities unless financing mechanisms are put in place. Water delivery requires heavy investment in collecting it from a natural source, treating it to make it potable, and laying a distribution network of pipes for delivery to the users. It also requires investments in sewerage infrastructure and sewage treatment plants so that the sewers can carry the wastewater to these plants to ensure that no untreated sewage is discharged back into natural water bodies. If our cities were rich enough to meet the entire cost, water could be delivered free. They are not.

4. What is the most logical and crucial message conveyed by the passage?
(a) Urban local bodies must recover costs through user charges.
(b) Urban local bodies are not efficient enough to meet the water requirements of our cities.
(c) Water shortage in our cities is a perennial problem that cannot be solved.
(d) In view of the water crisis in our cities, there is an urgent need to limit the population of cities by adopting an upper limit of population size.

Ans: A
Option (a) is correct: Since the first line of the passage suggests that financing mechanisms are to be put in place, it is a way to recover costs.
Option (b) is incorrect: The passage talks about the financing that is required for infrastructure to deliver the water. It does not say that the urban bodies are inefficient.
Option (c) is incorrect: The passage does not say that water shortage is a problem that cannot be solved. It says that sustainable delivery is possible with financing mechanisms.
Option (d) is incorrect: It is not correct because the passage does not say anything about overpopulation being a reason for the water crisis.

5. Which reference to the above passage, the following assumptions have been made:

1. Rich cities only can ensure sustainable delivery of water.
2. Sustainable delivery of water in cities means much more than supplying water to households.

Which of the above assumptions is/are valid?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans: B

Statement 1 is incorrect: The passage says that sustainable delivery of water is possible through proper financing mechanisms. It does not say that only rich cities can ensure sustainable delivery of water. It says that rich cities can afford the delivery of water for free.
Statement 2 is correct: Just delivery of water to households does not mean sustainable delivery of water. Sewage treatment plants also have to be installed to ensure that waste water is not discharged into water bodies.

Passage – 5

In India, agriculture still engages about half of its workforce, and about 85 per cent of its farms are small and marginal. Compared to China and Vietnam, which have experienced fast structural and rural transformation, India's story is of slow transformation. As a result, poverty reduction in India was at much slower pace during 1988-2014, compared to China and Vietnam. India's poverty reduction was slow during 1988-2005, but during 2005-2012, it accelerated dramatically–almost three times faster than during the earlier period. What did India do during this period? Research reveals that the relative price scenario changed significantly (by more than 50%) in favour of agriculture in the wake of rising global prices. This boosted private investments in agriculture by more than 50%. As a result, agri-GDP growth touched 4.1% during 2007-2012 as against 2.4% during 2002-2007. The net surplus of agri-trade touched $25 billion in 2013-2014; real farm wages rose by 7% per annum. All this led to unprecedented fall in poverty.

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

1. Structural and rural transformation is impossible when farms are mainly small and marginal.
2. A good price incentive can trigger investments in agriculture.
3. India needs to build value chains for high-value agri-products like livestock and horticulture.
4. Higher global prices of agricultural commodities are essential for India's poverty reduction.

Which of the above assumptions are valid?

(a) 1 and 3
(b) 2 and 4
(c) 2 and 3
(d) 3 and 4

Ans: C

Statement 1 is incorrect: We cannot say for sure that structural and rural transformation is not possible when farms are mainly small and marginal. The second sentence in the passage clearly states that there is transformation even through there are small and marginal farmers, but it was slow.
Statement 2 is correct: The statement is a valid assumption because the passage states that private investments were boosted in the wake of rising global prices.
Statement 3 is incorrect: The passage does not state anything about building value chains for high-value agri-products.
Statement 4 is correct: The passage states that during 2005-2012 the dramatic increase in growth is due to the rising prices in the global market.

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

(a) India should create large-scale off-farm rural employment to reduce poverty in the near future.
(b) India should create a large number of farmer producer companies.
(c) Private investment in agriculture should be given priority over public investment.
(d) Inclusive agricultural growth is key to reduce poverty in the near future.

Ans: D

The main theme of the passage is poverty reduction in India. Option (c) may seem right because private investment boosts the growth in the country. But option (d) states regarding the need for inclusive agricultural growth, i.e., structural and rural transformation, building high value chain for agri products etc.,

for reducing poverty which seems more right.

8. Two Statements S1 and S2 are given below with regard to four members P, Q, R and S followed by a Questions:
S1 : R is greater than P as well as Q.
S2 : S is not the largest one.

Question:
Among four numbers P, Q, R and S, which one is the largest?
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.

Ans: C
S1 states that R is greater than P and Q. So among R, P and Q, R is the largest.
S2 states that S is not the largest and we have no information regarding the others.
We cannot answer the question using S1 or S2 individually. From S1 and S2 together, we can state that R is the largest as S is not the largest one.

9. 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 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.
Ans: D
The question states that n is a natural number between 10 and 20.
So from S1 we can say that n might be 11 or 13 or 17 or 19.
From S2 we can say that n might be 13 or 17, since n when divided by 4 leaves a remainder of 1.
Even by combining both the statements S1 and S2, we cannot say whether n is 13 or 17.

10. 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.

Ans: C
S1 states that the product is 21. So the numbers can be (3, 7) or (21, 1).
S2 states that the sum of numbers is 10. The numbers can be (1, 9), (2, 8), (3, 7), (4, 6).
So from S1 and S2, it can be said that, the two numbers are (3, 7).

Directions for the following 6 (six) items:

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

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.

11. 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.

Ans: D
Option (a) is incorrect because the passage talks about the migration of labour from agricultural other sectors. It does not talk about rural to urban migration.
Option (b) is incorrect because the passage states that 'construction and unregistered manufacturing which are not markedly better jobs', but it does not say why they are not better jobs. The reason there not better jobs may be income or working conditions or anything else. So option (b) can only be an assumption.
Option (c) is incorrect because the passage states that service sector is not creating additional jobs. Option (c) is contradictory to this.
Option (d) is correct because the last statement of the passage states that sectors that drive domestic demand can fill the jobs. Since health and education belong to the social sector, it is correct.

Passage – 2

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 induvial 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.

12. 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

Ans: A
Statement 1 is correct: For state to ensure that it is not abstaining from rightful free expression, it should have institutions to oversee the society.
Statement 2 is correct: The last sentence of the passage clearly states that state should ensure that private parties do not block the right of free expression.
Statement 3 is wrong: The passage does not state anywhere that digital economy is not compatible with citizen's right.

Passage – 3

One of the biggest ironies around water is that a 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 effort at augmenting water supply rather than strengthening the capacities of ecological systems.

13. 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.

Ans: (c)
Option A is incorrect: The passage does not state anything about Ramsar Convention.
Option B is incorrect: The passage is suggesting that policies must focus on strengthening the capacity of the source of water. But option (b) i.e. is suggesting focusing on modernizing and augmenting the water system which is wrong.
Option C is correct: The first statement clearly states that rivers and wetlands are not given proper importance. So, the statement given in Option (c) that wetlands need to be reinforced as more than just open sources of water, can be correct.
Option D is incorrect: The passage here does not talk about the misuse of water.

Passage – 4

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.

14. 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.

Ans: (a)
Option A is correct: The last part of the passage states different kinds of investment and says that all the extreme forms of risks do not manifest at the same time. So option (a) seems the best suggestion.
Option B is incorrect: Though the option seems right, the passage does not talk about generating wealth.
Option C is incorrect: Nowhere does the passage mention about an asset management company. It speaks about investments made by individuals.
Option D incorrect: Though the passage implies that investing your money is a risky business, it is not a suggestion.

Passage – 5

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 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.

15. 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 improved 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

Ans: (b)
Statement 1 is correct: The passage states that at present regulation aspect primarily focuses the generation of GM crops only but socio-economic impacts and climate change adaptation need to be assessed, which is an ongoing process.
Statement 2 is not a valid assumption. Passage does not talk about the participation of people in policy decisions.
Statement 3 is a valid assumption. "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." Above statement clearly validates the statement.
Statement 4 is not a valid assumption. The author nowhere talks about the participation of political executive in biotechnology regulation.

16. Which one of the following statements best implies the crux of the passage?
(a) Precautionary principle is not given importance in current debate on developing GM crops.
(b) Biotechnology is not currently used in climate change mitigation and adaptation mechanisms.
(c) Biotechnology's role is not confined to the current priorities of developing GM crops.
(d) The negative impacts of biotechnology are not properly understood.
Ans: (c)
The passage states that current GM crops are engineered to focus on developing a single trait but in future focus will be on developing multiple traits. Biotechnology is also used in developing crops that can help in climate change mitigation and adaption.

17. How many zeroes are there at the end of the following product?
1 x 5 x 10 x 15 x 20 x 25 x 30 X 35 x 40 x 45 x 50 x 55 x 60
(a) 10
(b) 12
(c) 14
(d) 15

Ans: (a)
Multiple of 10 will bring a zero at the end, i.e. (2 × 5).
Let us write the given expression in simple factors as below
$1 \times 5 \times 10 \times 15 \times 20 \times 25 \times 30 \times 35 \times 40 \times 45 \times 50 \times 55 \times 60$
$= 1 \times 5 \times (5 \times 2) \times (5 \times 3) \times (5 \times 2^2) \times (5 \times 5) \times (5 \times 3 \times 2) \times (5 \times 7) \times (5 \times 2^3) \times (5 \times 9) \times (5 \times 5 \times 2) \times (5 \times 11) \times (5 \times 2^2 \times 3)$
We have to find the number of 2's and 5's in the expression. Which one is lesser will be the number of zeros at the end of expression.
In the above simplified expression number of 2's = 10 and number of 5's = 14
The lesser of the two is 10, so there will be 10 zeros at the end.

18. 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)

Ans: (b)
Since XYZ is a three-digit number we can write it as 100X + 10Y + Z (as X is at hundreds place and Y is at tens place)
XYZ + YZX + ZXY = (100X + 10Y + Z) + (100Y + 10Z + X) + (100Z + 10X + Y) = 111 (X + Y + Z)
Hence, it is divisible by (X + Y + Z).
And 111 is divisible by 3, as well as 37.
Therefore, the expression XYZ + YZX + ZXY is not divisible by 9.

19. Let p, q, r and s be natural numbers such that

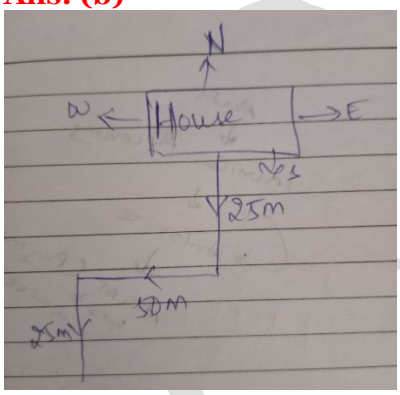
P – 2016 = q + 2017 = r – 2018 = s + 2019
Which one of the following is the largest natural number?
(a) P
(b) q
(c) r
(d) s

Ans: (c)
Let us assume s = 0 and substitute it in the given expression
Then, we get:
p – 2016 = q + 2017 = r – 2018 = 2019 ==> p – 2016 = 2019 => p = 2019 + 2016 = 4035
Also, q + 2017 = 2019 => q = 2019 - 2017 = 2
Also r – 2018 = 2019 => r = 2019 + 2018 = 4037
Therefore, r is the largest number.

20. How many five-digit prime numbers can be obtained by using all the digits 1, 2, 3, 4 and 5 without repetition of digits?
(a) Zero
(b) One
(c) Nine
(d) Ten

Ans: (a)
Given digits are 1, 2, 3, 4 and 5.
We know that if the sum of the digits of a number is divisible by 3, then that number is divisible by 3.
Here 5-digit prime number is to be formed without repetition of the digits. So, sum of the given digits = 1 + 2 + 3 + 4 + 5 = 15 .
15 is divisible by 3. Therefore, no 5-digit prime number can be made using these five-digits.

21. 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

Ans: (b)


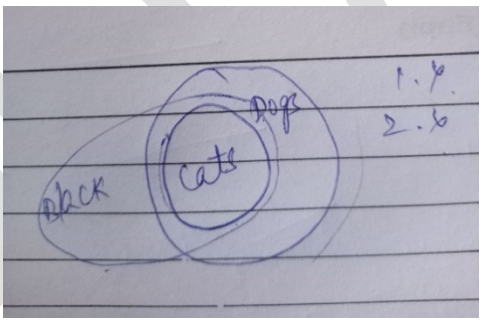
By looking at the diagram below we can say that man is in south-west direction from the starting point.

22. Two statements are given followed by two Conclusions:
Statements:
All numbers are divisible by 2.
All numbers are divisible by 3.
Conclusion-I:
All numbers are divisible by 6.
Conclusion-II:
All numbers are divisible by 4.

Which of the above Conclusions logically follows/follow from the two given Statements?
(a) Only Conclusion-I
(b) Only Conclusion-II
(c) Neither Conclusion-I nor Conclusion-II
(d) Both Conclusion-I and Conclusion-II

Ans: A
Conclusion-I is true: All numbers which are divisible by 2 and 3 are also divisible by 6.
Conclusion-ll is false: All numbers which are divisible by 2 and 3 need not be divisible by 4.
Ex: 18 is divisible by 2 and 3, but it is not divisible by 4.

23. Two Statements are given followed by two Conclusions:
Statements:
All cats are dogs.
All cats are black.
Conclusion-I:
All dogs are black.
Conclusion-II:
Some dogs are not black.
Which of the above Conclusions logically follows/follow from the two given Statements, disregarding commonly known facts?
(a) Only Conclusion-I
(b) Only Conclusion-II
(c) Neither Conclusion-I nor Conclusion-II
(d) Both Conclusion-I and Conclusion-II



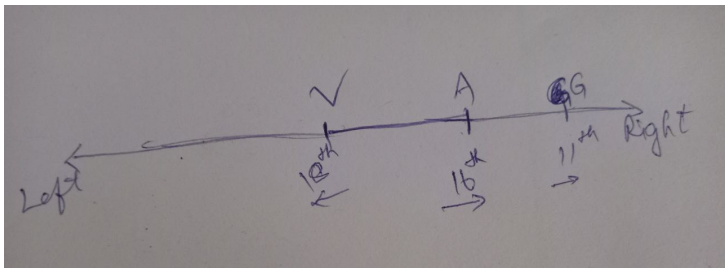
From the above diagram, we can say that both statements 1 and 2 are incorrect.

24. Consider the following sequence of numbers: 5147398572631586385224349 6
How many odd numbers are followed by the odd number in the above sequence?
(a) 5
(b) 6
(c) 7
(d) 8

Ans: (b)
Given sequence: 5 1 4 7 3 9 8 5 7 2 6 3 1 5863852243496
The odd numbers followed by another odd number are: 5, 7, 3, 5, 3, and 1. So, the number of odd numbers followed by odd numbers= 6

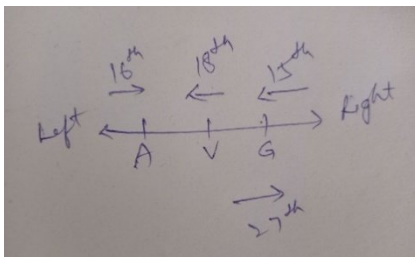
25. A is 16th from the left end in a row of boys and V is 18th from the right end. G is 11th from A towards the right and 3rd from V towards the right end. How many boys are there in the row?
(a) 40
(b) 41
(c) 42
(d) Cannot be determined due to insufficient data

Ans: (b)
Position of A: 16th from left end
Position of V: 18th from right end
Position of G: 11th from A towards the right and 3rd from V towards the right.
Now, two cases are possible:
Case I: A is to the right of V



This case is not possible, because when G is 11th to the right from A, G is not 3rd to the right of V.

Case II: A is to the left of V



Since G is 3rd from V towards the right, the position of G will be = 18 – 3 = 15th from the right end.
Since G is 11th from A towards the right, the position of G will be= 16 + 11 = 27th from left end.
Therefore, the total number of boys in the row = 27 + 15 – 1 = 41
1 is subtracted because G is counted twice.

26. Three Statements S1, S2 and S3 are given below followed by a Question:
S1 : C is younger than D, but older than A and B.
S2 : D is the oldest.
S3 : A is the older than B.

Questions:
Who among A, B, C and D is the youngest?
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) S1 and S2 together are sufficient to answer the Question.
(c) S2 and S3 together are sufficient to answer the Question.
(d) S1 and S3 together are sufficient to answer the Question.

Ans: (d)
S1: C is younger than D, but older than A and B, i.e. D > C > A/B Using statement 1 alone we cannot find out who is the youngest.
S2: D is the oldest, i.e. D > A/B/C
From statement 2 alone also we cannot determine who is the youngest.
S3: A is older than B, i.e. A > B
From statement 3 alone also we cannot determine who is the youngest.
From S1 and S3, we get:
D >C >A > B
So, B is the youngest
We require S1 and S3 to find out the solution.

27. How many integers are there between 1 and 100 which have 4 as a digit but are not divisible by 4?
(a) 5
(b) 11
(c) 12
(d) 13

Ans: (c)
The integers between 1 and 100 which have 4 as a digit are:
4, 14, 24, 34, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 54, 64, 74, 84 and 94.

So, there are a total 19 integers which have 4 as a digit.
Out of these, the integers which are divisible by 4 are:
4, 24, 40, 44, 48, 64 and 84
So, the number of integers not divisible by 4 = 19 – 7 = 12 integers.

28. Let x, y be the volumes; m, n be the masses of two metallic cubes P and Q respectively. Each side of Q is two times that of P and mass of Q is two times that of P. Let u = m / x and v = n /y. Which one of the following is correct?
(a) u = 4v
(b) u = 2v
(c) v = u
(d) v = 4u

Ans: (a)
According to the question, Volume of P = x, Volume of Q = y, Mass of P = m, Mass of Q = n
Mass of Q = 2 × Mass of P => n = 2m
Each side of Q is two times that of P.
Let each side of P be 'a' units and that of Q be '2a' units. Then, x=a^3 and y = (2a)^3 = 8a^3
From the question, u = m/x or u = m/a .... (1)
And v = n/y or v = 2m/8a^3 = m/4a^3 .....(2)
From (1) and (2) we get:
u/v = 4 ==> u = 4v

29. The average age of a teacher and three students in 20 years. If all the three students are of same age and the difference between the age of the teachers 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

Ans: (c)
Let the age of each student be x and the age of the teacher be y. According to the question,
3x + y = 20 × 4 ⇒ 3x + y = 80 ..... (1) And y – x = 20 ..... (2)
By subtracting equation (1) by (2) we get: 4x = 60 ⇒ x = 15 years
So, y = x + 20 = 15 + 20 = 35 years

30. A person bought a car and sold it for Rs. 3,00,000. If he incurred a loss of 20%, then how much did he spend to buy the car?
(a) Rs. 3,60,000 (b) Rs. 3,65000 (c) Rs. 3,70,000 (d) Rs. 3,75,000

Ans: (d)
20% loss, means SP is 20% less than CP.
SP = 0.8 CP ⇒3,00,000 = 0.8 CP ⇒ CP = Rs. 3,75,000

31. In the sum Y+ 1Y + 5Y + YY + Y1 = 1YY
For which digit does Y stand?
(a) 2
(b) 3
(c) 4
(d) 5
Ans: (b)

Going by substituting the options in place of Y
Option (a): substituting Y = 2, we get:
2 + 12 + 52 + 22 + 21 = 122 ... (1)
LHS and RHS of (1) are not equal.

Option (b): substituting Y = 3, we get:
3 + 13 + 53 + 33 + 31 = 133 ..... (2)
LHS and RHS of (2) are equal.

32. If you have two straight sticks of length 7.5 feet and 3.25 feet, what is the minimum length

can your measure?
(a) 0.05 foot
(b) 0.25 foot
(c) 1 foot
(d) 3.25 feet

Ans: (c)
Length of stick S1 = 7.5 feet
Length of stick S2 = 3.25 feet
To get the minimum length which we can measure, we will use stick S2 and measure the length of stick S1.
Therefore, we get:
Total length of S1 = 3.25 + 3.25 + remaining length of S1
Or 6.5 + remaining length of S1 = 7.5
Or remaining length of S1 = 7.5 – 6.5 = 1 foot

33. A simple mathematical operation in each number of sequence 14, 18, 20, 24, 30, 32, … results in a sequence with respect to prime numbers. Which one of the following is the next number in the sequence?
(a) 34
(b) 36
(c)38
(d)40

Ans: (c)
The operation mentioned in the sequence is subtracting 1 from the given number.
14 – 1 = 13
18 – 1 = 17
20 – 1 = 19
24 – 1 = 23
30 -1 = 29
32 – 1 = 31
The next prime number after 31 is 37. So the number after 32 must be 37+1 = 38

34. One page is torn from a booklet whose pages are numbered in the usual manner starting from the first page as 1. The sum of the numbers on the remaining pages is 195. The torn page contains which of the following numbers.
(a) 5, 6
(b) 7, 8
(c) 9, 10
(d) 11, 12

Ans: (b)
Let us assume the number of pages in the book to be n.
Sum of consecutive numbers from 1 to n = n(n+1)/2 = approximately 195 => n(n+1) = approximately 390
The value of n(n+1) must be greater than 390 as one page was torn.
For n=19, sum = 380.
For n=20, n(n+1) = 20 × 21 = 420 =>n (n+1)/2 = 210
As the sum should be greater than 390, we can conclude that the number of pages n=20.
So, sum of 20 pages = n(n+1)/2 = (20 × 21)/2 = 210
Sum of the two numbers on the torn page = 210 – 195 = 15
So the numbers on the pages should be 7 and 8 from the options.

35. Consider the following arrangement that has some missing letters:
abab_b_bcb_dcdcded_d
The missing letters which complete the arrangement are
(a) a, b, c, d
(b) a, b, d, e
(c) a, c, c, e
(d) b, c, d, e

Ans: (c)
The given sequence follows following sequence
abab**a**
b**c**cb
cdcdc
ded**e**d

36. Let A3BC and DE2F be four-digit numbers where each letter represents a different digit greater than 3. If the sum of the numbers is 15902, then what is the difference between the values of A and D?
(a) 1
(b) 2
(c) 3
(d) 4

Ans: (c)
Since each letter represents a different digit greater than 3 we can replace the letters with 4, 5, 6, 7, 8, or 9.
A3BC + DE2F = 15902

When C & F are added we get 2 in the unit digit. The pair of numbers which when added give 2 as unit digit are (4, 8) or (5, 7). So, c & F can be (4, 8) or (5, 7).

We should get zero in ten's place.
We got carry 1 from 12. Now, we know that the tens digit of the sum, 15902 is 0.
B + 2 = 9 => B = 7
Then, C, F cannot be (5, 7). They must be (4, 8).

In the place of hundredth digit, we got a carry of 1 from 10. Now, we know that the hundredth digit of the sum, 15902 is 9.
E + 3 = 8 => E = 8 – 3 = 5
Therefore, B =7, C = 4/8, E = 5 and F = 4/8 => A/D = 6/9
So, difference between A and D = 9 – 6 = 3

37. Two statements S1 and S2 are given below followed by a Question:
S1 : There are not more than two figures on any page of a 51-page book.
S2 : There is at least one figure on every page.
Question:
Are there more than 100 figures in that book?
Which one of the following is correct in respect of the above Statements and the Question?
(a) Both S1 and S2 are sufficient to answer the Question, but neither S1 alone nor S2 alone is sufficient to answer the Question.
(b) S1 alone is sufficient to answer the Question.
(c) S1 and S2 together are not sufficient to answer the Question.
(d) S2 alone is sufficient to answer the Question.

Ans: (c)
From statement 1, there can be 2, 1 or 0 figures on each page. Since there are 51 pages in the book, the maximum possible images in the book = 51 × 2 = 102
And the minimum possible images in the book = 0
Therefore, statement 1 alone is not sufficient.

From statement 2, there is 1, 2, 3, 4..... ∞ images on each page and we do not know the number of pages in the book.
Statement 2 alone is not sufficient to answer the question.

If we use both the two statements together, we know that there are 51 pages in the book and every page has 1 or 2 images.
So, maximum possible images in the book = 51 × 2 = 102
And the minimum possible images in the book = 51 × 1 = 51
But we do not know whether there are more than 100 figures in the book.
S1 and S2 together are not sufficient to answer the question.

38. Consider the following table:

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

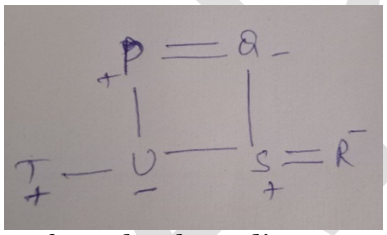
What is the value of *x* in the above table?
(a) 7.8
(b) 7.6
(c) 7.4
(d) 7.2

Ans: (a)
Let the number of girls be p and number of boys be q.
Overall average marks in English = Total marks in English / Total Students = (9p + 8q) / (p + q) = 8.8
=> 9p + 8q = 8.8p + 8.8q => 0.2p = 0.8q => p = 4q .....(1)

Overall average marks in Hindi = Total marks in Hindi / Total Students = (8p + 7q) / (p + q) = x
Putting value of p from (1), we get:
(8 × 4q + 7q) / (4q + q) = x => 39q/5q = x => x = 7.8

39. 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

Ans: (b)
There are two generations of which 3 are males (T, S and one other) and 3 are females (U, Q and one more).
We have no information about the gender of P and R.
According to the question, these are definitely married – P, Q, R and T is definitely single. We do not know whether S and U are married or not.
As U is P's daughter and Q is R's mother-in-law, it means that P and Q belong to the senior generation and U and R belong to the junior generation.
The family diagram can be drawn as below:



So from the above diagram, we can say that R is S's wife.

40. In the particular year 12th January is a Sunday, then which one of the following is correct?
(a) 15th July is a Sunday if the year is a leap year.
(b) 15th July is a Sunday if the year is not a leap year.
(c) 12th July is Sunday if the year is a leap year.
(d) 12th July is a not Sunday if the year is a leap year.

Ans: (c)
Number of odd days in January = Remainder of [(31 - 11)/7] = Remainder (20/7) = 6
Odd days in February = 0 (if non-leap year), 1 (if leap year)
Odd days in March = Remainder [31/7] = 3
Odd days in April = Remainder [30/7] = 2

Odd days in May = Remainder [31/7] = 3
Odd days in June = Remainder [30/7] = 2
The number of odd days till June in a non-leap year = 6 + 0 + 3 + 2 + 3 + 2 = 16 = 2
The number of odd days till June in a leap year = 6 + 1 + 3 + 2 + 3 + 2 = 17 = 3
July 12 means 11/7= 4 more odd days.
July 15 means 14/7= 0 more odd days.
Day on July 12th (non-leap year): Sunday + 2 + 4 = Saturday
And, day on July 12th (leap year): Sunday + 3 + 4 = Sunday

Directions for the following 6 (six) items:
Read the following **five passages** and answer the items that follow. Your answers to these items should be based on the passages only.

Passage – 1

Bank credit to the industrial sector has started shrinking. Its decline has been a serious concern as credit growth is essential to revive investment. The problem's origins lie in the incomplete reforms of the last 25 years. An institutional change that should have followed the 1991 reforms should have been setting up of a resolution corporation for banks. In a market economy with booms and busts, banks should be allowed to be set up and to fail. Today, we cannot shut down banks because there is not proper system to shut them down. Weak loss-making banks continue to need more capita

41. Which one of the following is the most logical and rational inference that can be made from the above passage?
(a) Indian banking system is not able to help the country in its economic growth.
(b) Economic reforms that started in 1991 have not helped in improving the economy to expected levels.
(c) India lacks the institutional mechanisms to deal with the failure of banks.
(d) Encouraging the foreign investments in our industrial sector is a good alternative to this sector's dependence on banks for credit.

Ans: (c)
Option A is incorrect. The passage talks about the decline of credit to the industrial sector but it does not talk about the banking system's role on economic growth.
Option B is incorrect. The passage says that the reforms are incomplete. Many other things could have been included in the reform process like including a resolution corporation for banks. But the passage does not say that reforms have not helped in the growth of the economy.
Option C is correct: The passage clearly states that resolution corporation for banks is missing in the reforms.
Option D is incorrect: The passage does not say anything about foreign investments.

Passage – 2

India has tremendous potential for solar energy. We all realize that we have to stop burning fossil fuels to meet our energy needs. But certain renewable resources are still going through their cost curves and learning curves to get the required amount of output. The Indian Government has strongly committed to its targets of reducing emissions by 33 per cent by 2030, and towards this it has initiated a strong push towards a gas-based economy-and has also invested heavily in renewable energy. However, business houses are wary of investing too heavily in renewable energy at a time when the technology is not yet ready.

42. Which one of the following is the *most logical and rational inference* that can be made from the above passage?
(a) India's commitment to reduce emissions by 33% is unlikely to be achieved.
(b) India should import gas rather than invest in renewable resources.
(c) Getting renewable resources to market too soon may be costly.
(d) India should put in more efforts in the exploration of natural gas.

Ans: (c)

Option A is incorrect: The statement in the passage says that Government is strongly committed to reducing emissions by 33% by 2030. So this option is false.
Option B is incorrect: The passage says that there is a push towards gas based economy and investment in renewable energy, but it does not say that we need to import gas.

Option C is correct: The statements in the passage "certain renewable resources are still going through their **cost curves and learning curves** to get the required amount of output. "and "**business houses are wary** of investing too heavily in renewable energy at a time when the **technology is not yet ready**." makes the option (c) correct inference.
Option D is incorrect: Passage says that there is push towards gas based economy, but it also says that more investment is required in renewable energy.

43. With reference to the above passage, the following assumptions have been made:
1. Governments often provide inefficient and costly subsidies for technologies that may not be ready in the near future.
2. India's commitment of reducing emissions by 33% by 2030 shall be on the basis of gas-based economy.
Which of the above assumptions is/are valid?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans: (d)
Statement 1 is false: The Passage nowhere says about governments providing **subsidies** for technologies that may not be ready in the near future.
Statement 2 is false: The passage says that Indian government is committed to reduce emissions by 33 percent by 2030 but it does not say it is solely on the basis of gas based economy.

Passage – 3

Genome editing is different from genome modification. Genome editing typically involves finding the part of a plant genome that could be changed to render it less vulnerable to disease, or resistant to certain herbicides, or to increase yields. Researchers use 'molecular scissors' to dissects the genome and repair it, which is a process that occurs naturally when plants are under attack from diseases and can throw up new mutations that enable the plant to survive future attacks. This evolutionary process can effectively be speeded up now that it is possible to examine plant genome in detail in laboratories, and create mechanisms through which the relevant genes can be altered very precisely.

44. With reference to the above passage, the following assumptions have been made:
1. Genome editing does not require the transfer of genes from one plant to another.
2. Through genome editing, the chosen genes can be altered precisely in a manner akin to the natural process that helps plants to adapt to the environmental factors.
Which of the above assumptions is/are valid?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans: (c)
Statement 1 is correct: The passage says that "Genome editing typically involves finding the part of a plant genome that could be changed to render it less vulnerable to disease, or resistant to certain herbicides, or to increase yields." It does not say transfer of genes is required, so this option is correct.
Statement 2 is correct: As the passage mentions, "This evolutionary process can effectively be speeded up now that it is possible to examine plant genomes in detail in laboratories, and create mechanisms through which the relevant genes can be altered very precisely".

Passage – 4

Many people understand the connection between solid waste management and health in terms of the consequences of unattended heaps of dry garbage which become home for flies and other vermin. However, there is another aspect that is not well-understood, that is, what happens when unscientific solid waste management combines with poor drainage and dumping of untreated sewage into drains which are meant to carry storm water during rains. The result is choked drains which are full of stagnant water breeding mosquitoes, resulting in the spread of water-borne diseases.

45. In the context of India, which one of the following statements *best reflects the critical message* of the passage?
(a) In India, the drainage networks are not separate for sewerage and storm water.
(b) Urban local bodies do not have enough resources and legislative authority to deal with the problems of waste management.
(c) Solid waste management should be integrated with the maintenance of drainage and sewerage networks.
(d) Bad management of solid waste and sewerage systems by our municipalities is the reason for drinking water shortages in our cities.

Ans: (c)
Option C is correct: Solid waste management does not only mean dry garbage, as attracting flies and other vermin, but they ignore (or do not completely understand) the other important facet of the harmful effects of dumping of garbage into drains meant to carry storm water during rains.

Passage – 5

In Part III of the Constitution, which assures people certain fundamental rights, Article 25 proclaims that "all persons are equally entitled to freedom of conscience and the right freely to profess, practise and propagate religion". What people fail to notice is that this proclamation is prefixed with the words "subject to public order, morality, health and to the other provisions of this Part", which set conditions precedent for the legal protection of religious practices of any community. The closing words of this prefatory rider in Article 25 virtually constitute a subordination clause placing other fundamental rights mentioned in Part III over and above the right to religious freedom. Among those other fundamental rights is the right to equality before law and equal protection of laws–assured at the outset and elaborated in later articles to mean, inter alia, that the State shall not deny equal protection of laws to any person or group of persons on the basis of religion alone.

46. What is the most logical inference from the above passage?
(a) State shall not interfere with the religious affairs of the citizens.
(b) Religious freedom under the Constitution is open to State intervention.
(c) Religious freedom of the citizens is not covered under fundamental rights.
(d) Religious practices of any community are immune to State laws

Ans: (b)
Option B is correct. The passage states that, "The closing words of this prefatory rider in Article 25 virtually constitutes a subordination clause placing other fundamental rights mentioned in Part Ill over and above the right to religious freedom". The state can intervene, if other fundamental rights in part III are taken over under the garb of Article 25.

47. How many different 5-letter words (with or without meaning) can be constructed using all the letters of the word 'DELHI' so that each word has to start with D and end with I?
(a) 24
(b) 18
(c) 12
(d) 6

Ans: (d)
Since the positions of D and I are fixed, only E, L, H have to be arranged. These 3 letters are to be arranged in $3! = 3 \times 2 \times 1 = 6$ ways.

48. A bottle contains 20 litres of liquid A. 4 litres of liquid A is taken out of it and replaced by same quantity of liquid B. Again 4 litres of the mixture is taken out and replaced by same quantity of liquid B. What is the ratio of quantity of liquid A to that of liquid B in the final mixture?
(a) 4 : 1
(b) 5 : 1
(c) 16 : 9
(d) 17 : 8

Ans: (c)
Out of 20 litres of liquid A, 4 litres is taken out, so the liquid A is decreased by 20%.
This process is repeated again, again there is 20% decrease.

So the consecutive percentage change = x + y + (xy/100) = -20 – 20 + 4 = -36%
If initially liquid A was 100 litres, now after 36% reduction, only 64 litres is left. The remaining 36 litres is liquid B.
Therefore, the ratio of A and B in the final mixture = 64 : 36 = 16 : 9

49. The average score of a batsman after his 50th innings was 46.4. After 60th innings, his average score increases by 2.6. What was his average score in the last ten innings?
(a) 122
(b) 91
(c) 62
(d) 49

Ans: (c)
The total score after his 50^{th} innings = 46.4 x 50 = 2320
The total score after his 60^{th} innings = 49 x 60 = 2940

So the score in the last 10 innings = 2940-2320 = 620
So the average score of the last 10 innings = 620/10 = 62

50. As a result of 25% hike in the price of rice per kg, a person is able to purchase 6 kg less rice for Rs. 1,200. What was the original price of rice per kg?
(a) Rs. 30
(b) Rs. 40
(c) Rs. 50
(d) Rs. 60

Ans: (b)
Let the price of rice be p and the original quantity of rice be q. So, p x q = 1200 ... (1)
After increase in price, the price will be 1.25p and the quantity of rice is q-6. So, 1.25p x (q-6) = 1200 ...(2)

Equating both the equations (1) and (2),
p x q = 1.25p x (q-6) => q = 1.25 (q-6) => 0.25q = 1.25 x 6
q = 30

Substituting q = 30 in equation (1), we get p = 40. So the original price of rice is Rs. 40

Passage – 1

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 *'Phytophthora 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.

51. 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.

Ans: (d)
Statement D is the correct answer.
The passage is depicting a scenario where only one type of food is grown, which when exposed to fungus results in large scale famine. Option (d) is the best message according to the given passage.

Passage – 2

India is at once among the fastest growing global economies and home to the largest number of malnourished children in 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 of their healthy peers.

52. With refence 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

Ans: (b)
Statement 1 is incorrect as just monitoring the PDS system will not result in better results.
Statement 2 is correct as it is related to the health of both mother and child.
Statement 3 is correct as it helps in providing much needed nutrition to the child and also improves the survival rate.
Statement 4 is correct as supply of safe drinking water and proper sanitation facilities to all ensures in checking the spread of diseases and malnutrition in children.
Statement 5 is correct as the passage implies that children are subject to diseases due to lack of proper nutrition and associated diseases, so vaccination drives should be ensured by authorities .

Passage – 3

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. It's 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 or 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.

53. 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 improved soil quality.
4. In the context of northern Indian agriculture, paddy straw has no usefulness.
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

Ans: (c)
Statement 1 is incorrect as nowhere in the passage, the author mentions about the farmer's remuneration in both the crops .
Statement 4 is incorrect as the last statement says that burning it is the easiest option, which means that paddy straw does have usefulness outside the field.
Statement 5 is incorrect as it has not been mentioned in the passage that mechanized farming is the main cause for stubble burning.

Passage – 4

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.

54. 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

Ans: (d)
Option D is the correct answer: All the 3 assumptions are valid as, statement 1 and 3 are regarding the practices of managing dams and statement 2 is valid as the whole passage is centered on the same theme.

Passage – 5

Economic liberalization in India was shaped largely by the economic problems of the government than by the economic priorities of the people or by the long-term development objectives. Thus, there were limitations in conception and design which have been subsequently validated by experience. Jobless growth, persistent poverty and rising inequality have mounted as problems since economic liberalization began. And all these years later, four quite crises confront the economy; agriculture, infrastructure, industrialization and education as constraints on the country's future prospects. These problems must be resolved if economic growth has to be sustained and transformed into meaningful development.

55. Which of the following is/are the most rational and logical inference/inferences that can be made from the passage?
1. It is essential to rethink and redefine the economic role of the State in the quest for development.
2. India has not made effective implementation of its policies in social sectors nor made sufficient investments in them.
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

Ans: (c)
Statement 1 is correct: The first statement of the passage states that economic liberalization in India has to be shaped by long term development objectives rather than by the economic problems of the state.
Statement 2 is correct: Since effective implementation of policies in social sector was not made it has led to jobless growth, persistent poverty and rising inequality.

56. With reference to the above passage, the following assumptions have been made:
1. India's economy needs to be greatly integrated with global economy so as to create large number of jobs and to sustain its growth momentum.
2. Economic liberalization would cause large economic growth which would reduce poverty and create sufficient employment in the long run.
Which of the above assumptions is/are valid?
(a) 1 only
(b) 2 only
(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: (d)
Statement 1 is incorrect: The author blames economic liberalization or globalization for jobless growth, poverty and inequality in India.
Statement 2 is incorrect: According to the passage, sustained economic growth transformed into meaningful development. It is not economic liberalization that would reduce poverty and create sufficient employment in the long run.

57. A shop owner offers the following discount options on an article to a customer:
1. Successive discounts of 10% and 20%, and then pay a service tax of 10%.
2. Successive discounts of 20% and 10%, and then pay a service tax of 10%.
3. Pay a service tax of 10% first, then successive discounts of 20% and 10%.
Which one of the following is correct?
(a) 1 only is the best option for the customer.
(b) 2 only is the best option for the customer.
(c) 3 only is the best option for the customer.
(d) All the options are equally good for the customer.

Ans: (d)
Let the initial price of article be 100.

Checking option 1:
After 1st discount of 10%, the price will be 0.9 x 100 = 90
After 2nd discount of 20%, the price will be 0.8 x 90 = 72
After service tax of 10%, the price will be 72 + (0.1 x 72) = 72 + 7.2 = 79.2

Checking option 2:
After 1st discount of 20%, the price will be 0.8 x 100 = 80
After 2nd discount of 10%, the price will be 0.9 x 80 = 72
After service tax of 10%, the price will be 72 + (0.1 x 72) = 72 + 7.2 = 79.2

Checking option 3:
After service tax of 10%, the price will be 100 + (0.1 x 100) = 100 + 10 = 110
After 1st discount of 20%, the price will be 0.8 x 110 = 88
After 2nd discount of 10%, the price will be 0.9 x 88 = 79.2

As the final price is same through all the options, we can say that all the options are equally good.

58. The letters from A to Z are numbered from 1 to 26 respectively. If GHI = 1578 and DEF = 912, then what is ABC equal to?
(a) 492
(b) 468
(c) 262
(d) 246

Ans : (d)
When alphabets are numbered from A to Z with 1 to 26 respectively.
Then GHI = 789
DEF = 456

GHI = 789 x 2 = 1578
DEF = 456 x 2 = 912
Similarly, ABC = 123 x 2 = 246

59. What is the missing term @ in the following?
ACPQ : BESU :: MNGI : @
(a) NPJL
(b) NOJM

(c) NPIL
(d) NPJM

Ans: (d)
We have to first find the pattern in 1st pair and apply it to 2nd pair.
A + 1 à B
C + 2 à E
P + 3 à S
Q + 4 à U

For MNGI applying the same pattern,
M + 1 à N
N + 2 à P
G + 3 à J
I + 4 à M

60. What is the largest number among the following?
(a) $(1/2)^{-6}$
(b) $(1/4)^{-3}$
(c) $(1/3)^{-4}$
(d) $(1/6)^{-2}$

Ans: (c)
Option (a): $(1/2)^{-6} = 2^6 = 64$
Option (b): $(1/4)^{-3} = 4^3 = 64$
Option (c): $(1/3)^{-4} = 3^4 = 81$
Option (d): $(1/6)^{-2} = 6^2 = 36$

We can see that option (c) is the largest number
61. A person x can complete 20% of work in 8 days and another person Y can complete 25% of the same work in 6 days. If they work together, in how many days will 40% of the work by completed?
(a) 6
(b) 8
(c) 10
(d) 12

Ans: (a)
Since X can complete 20% of the work in 8 days, he can complete 100% work in 40 days.
Similarly, Y can complete 25% of work in 6 days, so he can complete 100% work in 24 days.
The amount of work they will complete while working together for 1 day= 1/40 + 1/24 = (3 + 5)/120 = 8/120 = 1/15
So they will take 15 days to complete the whole work.
So the time needed to complete 40% of the work = 40% of 15 = 6 days

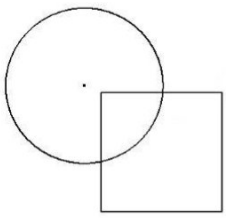
62. A car travels from a place X to place Y at an average speed of V km/hr, from Y to X at an average speed of 2v km/hr, again from X to Y at an average speed of 3v km/hr and again from Y to X at an average speed of 4v km/hr. Then the average speed of the car for the entire journey
(a) is less than v km/hr
(b) lies between v and 2v km/hr
(c) lies between 2v and 3v km/hr
(d) lies between 3v and 4v km/hr

Ans: (b)
Let us assume that the distance between X and Y be 12 km and v = 1 km/hr.
Time taken for 1st journey = Distance/Speed = 12/v = 12/1 = 12 hrs
Time taken for 2nd journey = 12/2v = 12/2 = 6 hrs
Time taken for 3rd journey = 12/3v = 12/3 = 4 hrs
Time taken for 4th journey = 12/4v = 12/4 = 3 hrs

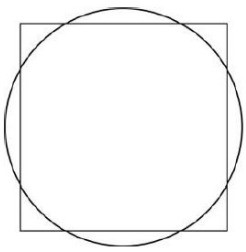
Total distance travelled will be = 12 × 4 = 48 kms
Average Speed = Total Distance/Total Time = 48 / (12 + 6 + 4 + 3) = 48/25
So, the average speed of the car for the entire journey lies between v and 2v.
Hence option (b) is the correct answer

63. Consider the following statements:
1. The minimum number of points of intersection of a square and a circle is 2.
2. The maximum number of points of intersection of a square and circle is 8.
Which of the above statements is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans: (b)
From Statement 1: The minimum number of points of intersection of square and circle is 2. It can be represented in the below diagram.



But there might also be a case where the circle is just touching the square. So the minimum number of point of intersection is 1. So, statement 1 is incorrect.
From Statement 2: The maximum number of points of intersection of a square and a circle is 8.
Since a circle cuts one side of a square at 2 points. The maximum number of points of intersection will be 8 as shown in the diagram.



64. A man takes half time in rowing a certain distance downstream than upstream. What is the ratio of the speed in still water to the speed of current?
(a) 1 : 2
(b) 2 : 1
(c) 1 : 3
(d) 3 : 1

Ans: (d)
If the time taken is half, then the speed must be double, as the distance is constant.
$x + y = 2(x - y) \Rightarrow x = 3y$
$x : y = 3 : 1$

65. How many pairs of natural numbers are there such that the difference of whose squares is 63?
(a) 3
(b) 4
(c) 5
(d) 2

Ans: (a)

Let the pair of natural numbers be x and y.
According to the question, $x^2 - y^2 = 63 \Rightarrow (x + y)(x - y) = 63$
There are three possible cases in which product of two numbers is 63.
Case 1 :
$(x + y) = 9$ and $(x - y) = 7$
Then $x = 8$ and $y = 1$

Case 2 :
$(x + y) = 21$ and $(x - y) = 3$
Then $x = 12$ and $y = 9$

Case 3 :
$(x + y) = 63$ and $(x - y) = 1$
Then $x = 32$ and $y = 31$
Therefore, there are three pairs of natural numbers such that the difference of their squares is 63

66. Which one of the following will have minimum change in its value if 5 is added to both numerator and the denominator of the fractions 2/3, 3/4, 4/5 and 5/6 ?
(a) 2/3
(b) 3/4
(c) 4/5
(d) 5/6
Ans: (d)
Original fractions and their decimal values are :
2/3 = 0.666
3/4 = 0.750
4/5 = 0.800
5/6 = 0.833

The new fractions (after adding 5 to numerator and denominator) and their decimal values are:
7/8 = 0.875
8/9 = 0.888
9/10 = 0.900
10/11 = 0.909
Now, change in values of fractions are:
(7/8) – (2/3) = 0.875 – 0.666 = 0.209
(8/9) – (3/4) = 0.888 – 0.750 = 0.138
(9/10) – (4/5) = 0.900 – 0.800 = 0.100
(10/11) – (5/6) = 0.909 – 0.833 = 0.076
we can see that the minimum change in value is in the fraction 5/6.

67. A digit n > 3 is divisible by 3 but not divisible by 6. Which one of the following is divisible by 4?
(a) 2n
(b) 3n
(c) 2n + 4
(d) 3n + 1

Ans: (d)
Let n=9, it is greater than, it is divisible by 3 but not by 6.
2n = 2 x 9 = 18, 18 is not divisible by 4.
3n = 3 x 9 = 27, 27 is not divisible by 4.
2n+4 = (2 x 9) + 4 = 22, 22 is not divisible by 4.
3n+1 = (3x9)+1 = 28, 28 is divisible by 4.

68. If 1 litre of water weighs 1 kg, then how many cubic millimetres of water will weigh 0.1 gm?
(a) 1
(b) 10
(c) 100

(d) 1000

Ans: (c)
We know that 1 litre = 10^6 cubic millimeters
Given that weight of 1 kg or 1000 grams = 10^6 cubic millimeters
Then, Weight of 0.1 grams = 100 cubic millimeters

69. A vessel full of water weighs 40 kg. If its is one-third filled, its weight becomes 20 kg. What is the weight of the empty vessel?
(a) 10 kg
(b) 15 kg
(c) 20 kg
(d) 25 kg

Ans: (a)
Let us assume that the weight of vessel be v and the weight of water in the vessel be w.
Now according to the question,
v + w = 40 ..... (1)
v + (w/3) = 20 => 3v + w = 60 kg ..... (2)
On solving equation (1) & (2), we get:
v = 10

70. A frog tries to come out of a dried well 4.5 m deep with slippery walls. Every time the frog jumps 30 cm, slides down 15 cm. What is the number of jumps required for the frog to come out of the well?
(a) 28
(b) 29
(c) 30
(d) 31

Ans: (b)
Given that the total length of the wall = 4.5 m = 450 cm
Total length covered by frog in one jump = 30 – 15 = 15 cm (15 is subtracted as the frog slides down)
Number of jumps required to cover 420 cm = 420/15 = 28 jumps
In 29^{th} jump the frog will reach the top of the wall and will not slide down.
So the total number of jumps required = 29

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

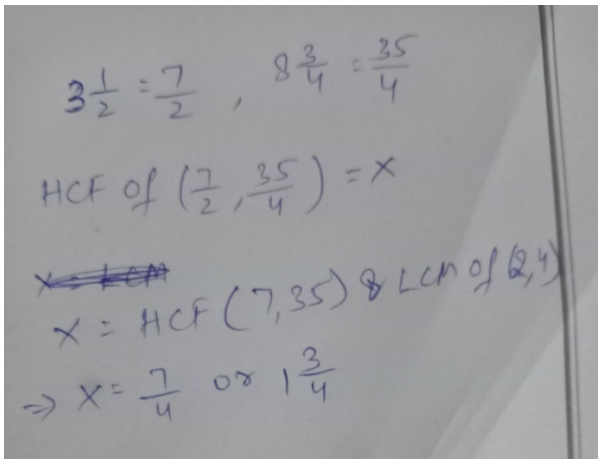
(a) $1\frac{1}{2}$ m

(b) $1\frac{1}{3}$ m

(c) $1\frac{1}{4}$ m

(d) $1\frac{3}{4}$ m

Ans: (d)



72. Consider the following data:

Year	*Birth rate*	*Death rate*
1911-1921	48.1	35.5
1921-1931	46.4	36.3
1931-1941	45.2	31.2
1941-1951	39.9	27.4
1951-1961	41.7	22.8
1961-1971	41.1	18.9
1971-1981	37.1	14.8

For which period was the natural growth rate maximum?
(a) 1911-1921
(b) 1941-1951
(c) 1961-1971
(d) 1971-1981
Ans: (d)
We know that Natural growth rate = Birth rate – Death rate
Considering the given years in the options:
Natural growth rate in the period 1911 -1921 = 48.1 – 35.5 = 12.6
Natural growth rate in the period 1941 -1951 = 39.9 – 27.4 = 12.5
Natural growth rate in the period 1961 -1971 = 41.1 – 18.9 = 22.2
Natural growth rate in the period 1971 -1981 = 37.1 – 14.8 = 22.3
From the above we can say that for the period 1971 – 1981, natural growth rate was the maximum.

73. The recurring decimal representation 1.272727 ... is equivalent to
(a) 13/11
(b) 14/11
(c) 127/99
(d) 137/99

Ans: (b)
1.272727... can be written as 1 + 0.272727... = 1 + 3(0.909...) = 1 + 3(1/11) = 1+ (3/11) = 14/11

74. What is the least four-digit number when divided by 3, 4, 5 and 6 leaves a remainder 2 in each case?
(a) 1012
(b) 1022
(c) 1122
(d) 1222

Ans: (d)
L.C.M. of 3, 4, 5 and 6 = 60
So let us assume the required number to be 60x + 2
If x = 17, then the number = 60 × 17 + 2 = 1020 + 2 = 1022

75. In adult population of a city, 40% men and 30% women are married. What is the

percentage of married adult population if no man marries more than one woman and no woman marries more than one man; and there are no widows and widowers?
(a) 232/7 %
(b) 34%
(c) 240/7%
(d) 35%

Ans: (c)
If no man marries more than one woman and no woman marries more than one man, then the number of married men and women must be equal.
Given that 40% of men = 30% of women
Let there be 300 men and 400 women in the city. Therefore, the total number of adults is 700.
Number of married men = 40% of 300 = 120
Number of married women = 30% of 400 = 120
So, Number of married adults = 120 + 120 = 240
Percentage of married adults in the population = (240 / 700) × 100 = 240/7 %

76. What is the remainder when 51 x 27 x 35 x 62 x 75 is divided by 100?
(a) 50
(b) 25
(c) 5
(d) 1

Ans: (a)
Given expression is: 51 × 27 × 35 × 62 × 75
(51 × 27 × 35 × 62 × 75) / 100 = (51 × 27 × 35 × 62 × 3) / 4 = (51 × 27 × 35 × 31 × 3) / 2
So, we need to find the remainder when 51 × 27 × 35 × 31 × 3 is divided by 2.
The value of 51 × 27 × 35 × 31 × 3 must be an odd number as multiplication of odd numbers gives odd numbers only. So, when it is divided by 2, we will get 1 as remainder.
But we cancelled out 50 earlier.
So, the remainder when 51 × 27 × 35 × 62 × 75 is divided by 100 = 1 × 50 = 50

77. A sum of Rs. 2,500 is distributed among X, Y and Z in two ratio 1/2:3/4:5/6 . What is the difference between the maximum share and the minimum share?
(a) Rs. 300
(b) Rs. 350
(c) Rs. 400
(d) Rs. 450

Ans: (c)
Ratio of sum distributed among X, Y and Z = (1/2) : (3/4) : (5/6) = 6 : 9 : 10
Let us assume that the share of X, Y and Z be 6m, 9m and 10m respectively.
6m + 9m + 10m = Rs.2500 => 25m = 2500 => m = 100
The difference between maximum share and minimum share = 10m – 6m = 4m = 4 × 100 = Rs. 400

78. For what value of n, the sum of digits in the number $(10^n + 1)$ is 2?
(a) For n = 0 only
(b) For any whole number n
(c) For any positive integer n only
(d) For any real number n

Ans: (b)
Given number N = (10^n+1)
Substituting n=0 in (10^n+1), we get N = 1 + 1 = 2 (sum of digits is 2)
Substituting n=1 in (10^n+1), we get N = 10 + 1 = 11 (sum of digits is 2)
Substituting n=2 in (10^n+1), we get N = 100 + 1 = 101 (sum of digits is 2)
From the above, we can say that the sum of digits of number N will always be 2 if n is any whole number.

79. In a class, there are three groups A, B and C. If one student from group A and two students from group B are shifted to group C, then what happens to the average weight of the students of the class?
(a) It increases.

(b) In decreases.
(c) It remains the same.
(d) No conclusion can be drawn due to insufficient data.

Ans: (c)
As no student left the class, nor any new student joined, the total weight and number of students remain the same.
So, the average weight remains the same.

80. How many different sums can be formed with the denomination Rs. 50, Rs. 100, Rs. 200, Rs. 500, and Rs. 2,000 taking at least three denominations at a time?
(a) 16
(b) 15
(c) 14
(d) 10

Ans: (a)
Number of ways to leave out one of the denomination $=5C1 = 5$
(these are 2800, 2750, 2650, 2350, 850)
Case III : Using 3 denominations and leaving out 2 denominations
Number of ways to use three denominations $=5C3= (5 \times 4)/2 = 10$
(these are 350, 650, 2150, 750, 2250, 2550, 800, 2300, 2600, 2700)
So, the number of different sums that can be formed = 1 + 5 + 10 =16