CSAT 2020
DETAILED QUESTIONWISE SOLUTIONS (Set D)

1. In the sum

$$\otimes + 1\otimes + 5\otimes + \otimes\otimes + \otimes 1 = 1\otimes\otimes$$

for which digit does the symbol ® stand?

a. 2
b. 3
c. 4
d. 5

Sol. Ans.(b) Working backwards from options is the right technique here.

Option (a) will give –

2 + 12 + 52 + 22 + 21 = 109 (which is not 122). **So option (a) is wrong.**

Option (b) gives us –

3 + 13 + 53 + 33 + 31 = 133. **So option (b) is correct.**

At the most, in any question, you will need to check three options, and if first three are wrong, then fourth has to be right (no need to check).

[You only need to score more than 33% or 66 marks for CSAT paper. So pick and choose questions carefully, without wasting too much time on any one. This one was an easy question based on basic mathematical symbols and operations, and should have been done.]

2. 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

Sol. Ans.(b). 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)

[You only need to score more than 33% or 66 marks for CSAT paper. So pick and choose questions carefully, without wasting too much time on any one. This one was an easy question based on HCF and LCM, and should have been done.]

3.A simple mathematical operation in each number of the 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

Sol. Ans.(c). The given sequence is: 14, 18, 20, 24, 30, 32, ... We are told that by applying an operation, we get prime numbers from this series.

We can see that by subtracting 1 from each term, we will get a sequence of primes.

14 – 1 = 13; 18 – 1 = 17; 20 – 1 = 19; 24 – 1 = 23; 30 -1 = 29; 32 – 1 = 31.

So the next term will be 38 – 1 = 37 which is also a prime number.

So the correct option is (c).

[An easy question, that must be attempted.]

4.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

Sol. Ans.(b).

We know that the sum of n consecutive natural numbers = n(n+1)/2.

Natural numbers are integers starting with 1.

Now according the information given in question our value of n(n+1)/2 should be greater than 195.

Why? Because one page is torn, so the sum is less than what it should be. Right?

If we take n = 19 we will get n(n+1)/2 = 19 × 20/2 = 190 which is less than 195.

So taking next number let's assume n = 20.

In this case – n(n+1)/2 = 20×21/2 = 210. But two consecutive numbers were removed, so 210 – 195 = 15. **It means that the sum of the two consecutive torn pages should be 15. Only option (b) matches.**

[A question based on basic logic and numbers. Do not attempt this question. It is complex and you may invest a lot of time. Avoid it.]

5.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

Sol. Ans.(c). Observing the sequence and by putting various options you can find that the correct sequence is ababa bcbcb cdcdc deded. You have to find a repeated pattern. Only (c) gives that pattern.

By putting (a), we would get – ababa bbbcb cdcdc deddd – there is no pattern in it

By putting (b), we would get – ababa bbbcb ddcdc deded – there is no pattern in it

By putting (d), we would get – ababb bcbcb ddcdc deded – there is no pattern in it

[A simple series questions, based on simple reasoning. Must be attempted.]

6. 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

Sol. Ans.(c).

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      A   3   B   C
  +   D   E   2   F
  _____
  1   5   9   0   2
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Each letter represents different digits.

Unknown digits are 6 (A, B, C, D, E, F). Each digit is greater than 3 (possible digits are 4, 5, 6, 7, 8, 9). So each of these digits (4-9) will be used. We have to find A – D (or D – A).

Here, C + F is ending with 2. So, C and take two values 8 or 7. If C is 8 then F is 4 and if C is 7 then F is 5. In any case B + 2 + 1 (carry) is ending with 0 so **B = 7.** It means C can't take value 7, so **C = 8** and **F = 4.**

Now F + 3 + 1 (carry) is ending with 9 so E = 5. Hence there is no carry forward in the next term i.e. A + D = 15 and remaining digits are 9 and 6. Thus 9+ 6 = 6 + 9 = 15.

So the difference between A and D is 3. So correct option is (c).

[A question based on logic and number systems. A long and not easy question, to be avoided.]

7. 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 1oo 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.

Sol. Ans.(c). This is a Data Sufficiency question. It had vanished from CSAT but made a big entry in 2020!

Question – Are there more than 100 figures in that book?

Using S1 alone, number of figures on any page could be 0, 1 or 2. So minimum 0 (if every page will contain 0 figures) and maximum 102 figures (if every page will contain 2 figures) are possible. **So S1 is not sufficient to answer the question uniquely.**

Using S2 alone, number of figures on any single page could 1, 2, 3, ... up to infinity. **So it is also not sufficient to answer the question alone.**

Even combining both we can have either 1 or 2 figures on any page. Which gives us minimum 51 (if every page will contain 1 figure) and maximum 102 figure (if every page will contain 2 figures). **So it can't be answered uniquely even by combining S1 and S2.**

[Data Sufficiency questions made a comeback in this CSAT, and can be done if your are comfortable. Otherwise there are many more to be tried. You have to anyhow cross 33% net score.]

8. 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

Sol. Ans.(a).

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

So by the condition given in question we have $9g + 8b = 8.8 (b + g)$. That gives us ratio b:g = 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 8×4p + 7×p = X (4p + p)

=> 32p + 7p = 5p × X => 39p = 5pX => 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).]

9.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

Sol. Ans.(b).

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 –
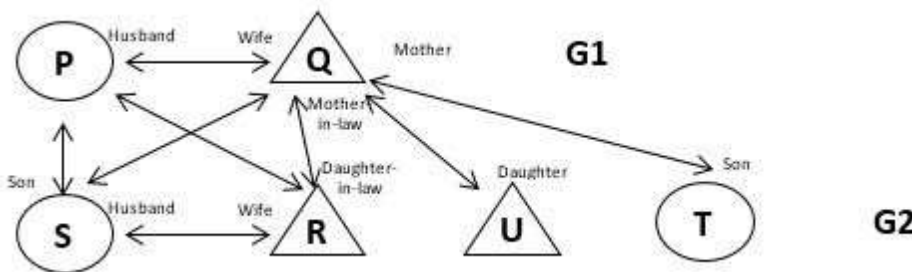
[You should skip this question in actual exam, as this is a qualifying paper, and this may take up too much time. Find other easier ones to solve, first]

10. If in a 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 a Sunday if the year is a leap year.
d.   12th July is not a Sunday if the year is a leap year.

Sol. Ans.(c).

Let's calculate what day of week will be on July 12 (Considering Jan 12 is Sunday and it is a non-leap year).

Total number of odd days between Jan 12 and July 12 = 19 (remaining day of Jan) + 28 (Feb) + 31 (March) + 30 (April) + 31 (May) + 30 (June) + 12 (July) = 181.

Now, 181 when divided by 7 gives remainder of 6. So final odd days = 6.

So If Jan 12 is Sunday July 12 will be Saturday (in a non-leap year).

In a leap year July 12 will be Sunday as one extra day will be added of Feb 29.

[A question based on calendars and dates. Not difficulty, but time consuming. Pick and choose carefully.]

11.A man walks down the backside of his house straight 25 meters, then turns to the right and walks 50 meters again; then he turns towards left and again walks 25 meters. 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

Sol. Ans.(d). Here is the diagram representing the movement –
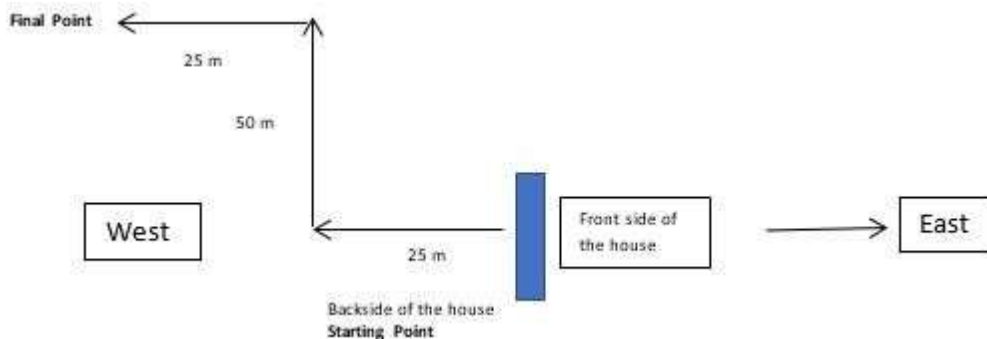
From the diagram given above, it is clear that he will be in North-West direction from the starting point.

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

12. 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-Il

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 Conclusions-I and Conclusion-II

Sol. Ans.(a).

Given statements are – first, all numbers are divisible by 2 and second, all numbers are divisible by 3. If a number is divisible by 3 and 2 then it will surely be divisible by 6 (which is 2 x 3), but will not be necessarily divided by 4.

For example – 6, 18, 30 … are all such numbers. **Hence only conclusion 1 is true (logically follows).**

[Another logical question based on Statement-Conclusion format. Can be done.]

13. Two Statements are given followed by two Conclusions:

Statements:

All cats are black.
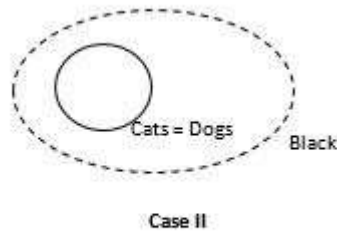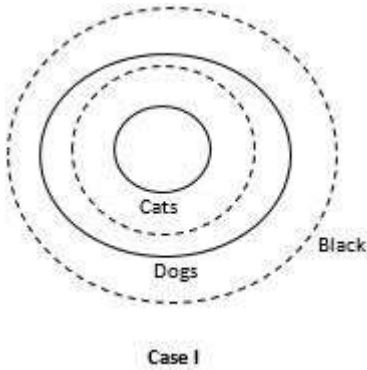
Conclusion-I:

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 Conclusions-I and Conclusion-Il

Sol. Ans.(c).

Neither of the conclusions will be true for the given syllogism argument. To understand let's have look on the following Euler/Venn diagrams. The circle represents Cats, Dogs and Black (dotted circle).

Case I

Case II

Above argument can be drawn in the two ways. In both the cases you can see that in some cases all dogs can be blacks but then in some cases it is not. Hence conclusion I not follows. Similarly 'every dog will be black' if the dotted circle will be congruent to the circle representing dog. **So in this case conclusion II does not follow.** To be a valid conclusion it should be true in every case. Hence both the conclusions are not valid.

[Another logical question based on Statement-Conclusion format. Can be done.]

14. Consider the following sequence of numbers:

5 1 4 7 3 9 8 5 7 2 6 3 1 5
8 6 3 8 5 2 2 4 3 4 9 6

How many odd numbers are followed by the odd number in the above sequence?

a. 5
b. 6
c. 7
d. 8

Sol. Ans.(b).

Given sequence is – 5 1 4 7 3 9 8 5 7 2 6 3 1 5 8 6 3 8 5 2 2 4 3 4 9 6.

It happens six times when an odd number is followed by another odd number. See the bold digits (51, 73, 39, 57, 31 and 15).

[Another simple number series identification question. Must be done.]

15. A is 16th from the left end in a row or boys and V is 18th from the right end. Q 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

Sol. Ans.(b). Refer to the diagram given below.
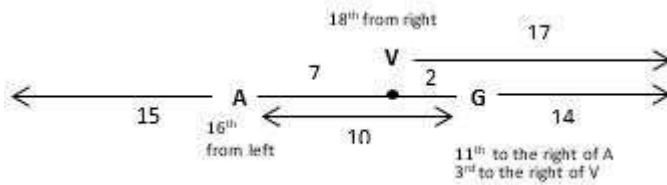
A is 16th from left so 15 students will be there to A's left. G is 11th to right from A and 3rd to right from V. So there will be 7 students between A and V and 2 students between V and G. Consequently there will 14 students to the right of G. So total number of Students will 15 + 7 + 2 + 14 + A(1) + 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!]

16. 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 older than B.

Question:

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.

Sol. Ans.(d).

Question asked is 'Who among A, B, C and D is the youngest?'

>Option (a): S1 alone is not sufficient. Because there is no clarity about A and B as to who will be younger.

Option (b): S1 and S2 together will also be not sufficient as again there will be not clarity about A and B as who will be younger.

Option (c): Combination S2 and S3 will not be sufficient as it does not provide any information about C.

Option (d): Combination S1 and S3 will give order D > C > A > B. **So, the youngest person will be B.**

[Logical reasoning question, of the Data Sufficiency variety. Not too tough, but not direct either. Choose carefully.]

17. 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

Sol. Ans.(c).

Between 1 and 100 there are 19 such integers which have 4 as a digit – 4, 14, 24, 34, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 54, 64, 74, 84 and 94.

Out of these, only 7 integers – 4, 24, 40, 44, 48, 64 and 84 are divisible by 4.

So correct answer will be 19 – 7 = 12. **A mechanical question but can be done.**

[Numbers based direct question. Can be attempted in first round itself.]

18. 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 or the following is correct?

a. u = 4v
b. u = 2v
c. v = u
d. v = 4u

Sol. Ans.(a).

Let the side of P = a, so the side of Q = 2a.

Volume of P (x) = a^3 volume of Q (y) = $8a^3$

Also, It is given that, mass of P (m) = u × X = u × a^3 ..... (1) and

Mass of Q (n) = v × y = v × $8a^3$ .....(2)

It is also given that Mass of Q (n) = 2 × mass of P (m).

So, by using equations 1 and 2 we have v × $8a^3$ = 2 × u × a^3 $\Rightarrow$ 4v = u.

So option (a) is correct.

[Avoid this algebra + mensuration based question, if you can do other questions first!]

19. 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/li>

Sol. Ans.(c).

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.]

20. 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, 65,000
  c. Rs. 3, 70,000
  d. Rs. 3, 75,000

Sol. Ans.(d).

Traditional Method –

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

CP = (SP × 100)/(100 – Loss%)

=>P = 3,00,000 × 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!]

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.

<div align="center">

Passage — 1

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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.

21. 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.

Sol. Ans.(d). 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 (d) 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.

[An easy passage, if you have been reading newspapers regularly. Carefully scan through all options before marking.]

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 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.

22. 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

Sol. Ans.(a). 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.

[A not so easy passage. Pick it at your own risk!]

Passage — 3

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.

23. 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 or water.
d. Water supply should not be free of cost so as to prevent its misuse or overuse.

Sol. Ans.(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.

[A not so easy passage. Needs some careful deliberation and elimination. But can be tried.]

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 or risks we know will not manifest at the same time.

24.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.

Sol. Ans.(a). 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 time 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'.

[A not so easy passage. Be careful with the options. Use elimination technique aggressively.]

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 or 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 or 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.

25.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

Sol. Ans.(d). Theme is "Evolving nature of biotechnology".

This passage has two questions and hence must be attempted.

Statement 1 is surely correct. It is evolving constantly. **So option (c) is eliminated.**

Between statements 2 and 3, st. 3 is much better (and worded as per passage). In fact, it includes what is written in statement 2. **So 3 is surely correct, and 2 may or may not be correct.**

Statement 4 is definitely correct, as without the political executive it is not possible.

So the only option with all of 1, 3 and 4 is option (d) which also has statement 2.

[A tough question. Handle with care!]

26. 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 not biotechnology are properly understood.

Sol. Ans.(c). Theme is "Evolving nature of biotechnology".

We are now asked the **"crux of the passage".**

The passage is talking mainly about what biotechnology is being used for today, and what is can be and must be used for in the coming years. Hence, option (c) best summarises the crux.

[This was an easy question. Since the passage had 2 questions, it must be solved.]

27. 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

Sol. Ans.(a).

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 × 5 × 10 × 15 × 20 × 25 × 30 × 35 × 40 × 45 × 50 × 55 × 60

= 1 × 5 × 10 × (3 × 5) × (2×10) × (5×5) × (3×10) × (7×5) × (4×10) × (9×5) × (5×10) × (11×5) × (6×10)

= 1 × (10 × 10 × 10 × 10 × 10 × 10) × (5 × 5 × 5 × 5 × 5 × 5 × 5 × 5) × (2 × 4 × 6) × (3 × 3 × 7 × 9 × 11)

= 1 × (10 × 10 × 10 × 10 × 10 × 10) × (5 × 5 × 5 × 5 × 5 × 5 × 5 × 5) × {2 × (2 × 2) × (2×3)} × (3 × 3 × 7 × 9 × 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.]

28. 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)

Sol. Ans.(b).

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

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

So, XYZ + YZX + ZXY = (100 X + 10Y + Z) + (100 Y + 10Z + X) + (100 Z + 10X + Y)

= 111X + 111Y + 111Z = 111 (X + Y + Z)

(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.]

29. 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

Sol. Ans.(c).

From the given relations, we have p – q = 4033; r – q = 4035 which clearly means r > p > q. Also r – s = 4037 which means r > s.

Thus, r is the greatest of all. So the correct option is (c).

[This is a simple question based on simple calculations, and must be done.]

30. 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

Sol. Ans.(a).

This looks tough, but is not. A number is prime if it is divisible by none other than 1 and itself.

Now take the digits 1,2,3,4 and 5. Just add them up once. We get 15 as the sum. Recall the rule of divisibility by 3.

"If the sum of the digits of a number is divisible by 3 then number will be divisible by 3".

So any number formed using these five digits will be divisible by 3. So it cannot be prime. Hence zero.

[A beautiful and logical question based on Prime numbers, which can be attempted if you remembered the rules of divisibility]

Directions for the following 7 (Seven) 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

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 Direct investment (FDl). 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.

31. 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

Sol. Ans.(b). Theme is "nature of private investment and employment".

The passage is talking about the nature of private investment and its fickle tendency. It explains why employment generation cannot be left to foreign private investment, and even its positive effects may get diluted due to inherent problems in Indian human capital.

So, statement 1 is surely correct. It is definitely assumed in it. Why? When we are constantly worried about the fickle nature of FDI (and local private investment), and its negative relation with employment generation, how can we rely on it as an economic policy? If 1 is correct, **then options (a) and (b) are possible answers but not (c) or (d).**

Now between (a) and (b), we have to check 2 and 3.

Focus on 2 – India can do nothing to reduce volatility in FDI because it is the inherent nature of FDI to seek higher returns (hence fickle – moves from here to there). Note the phrase "a necessary consequence". **So 2 is wrong. But 3 may be right, and 5 is surely right (last part of the passage).**

Why is 5 right? Education and health are bottlenecks (in absorbing new technology) so public investments will help.

Hence, correct answer is option (b). Also note that 4 is not explicitly talked about anywhere.

[A tough one, and must be tackled very carefully]

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 or 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.

32. 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 or 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

Sol. Ans.(a). Theme is "Water resources and utilization".

Passage is talking about shortages and excesses of water due to unpredictability and nature of Monsoon in India. It also talks about 'unutilized water which flows with the rivers'.

Statement 3 is not an implication we can get from the passage. Eliminate it. **So we are left with options (a) and (b) only.**

Now, how do we tackle the headache of water discharging into the oceans, unutilized? Statements 1 and 2 indicate possible solutions. Inter-linking of rivers will allow usage of excess water in deficit regions. And network of dams and canals will ensure timely harnessing of skewed monsoon flows.

Hence, (a) is best. Also, statement 3 is wrong, so (c) and (d) are ruled out.

[A tough question, but can be solved through elimination.]

Passage — 3

People will invest in education whenever they are granted the economic freedom to fully enjoy 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 of the higher income that they gain from incremental level of education, it makes 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.

33. With reference 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

Sol. Ans.(a). Theme is "Education and Taxation".

The term "human capital" is not explicitly mentioned in the passage, though some may feel it is an automatic outcome of more education for more people. But we cannot be sure if it is indeed assumed. So 3 is ruled out, and **hence options (c) and (d) are ruled out.**

Statement 2 is not correct. Investment in children's education (by parents) will be decided by factors like whether they will be able to use their education later, properly in an economic sense. It is not proper to derive the relation that "investment in education ensures economic freeom".

So best answer is (a).

[A tough question. Handle with care!]

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.

34. 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.

Sol. Ans.(a). Theme is "Cost of supplying water".

Try this passage as it has two questions.

Option (c) is clearly wrong, as it says "…cannot be solved".

Option (d) is wrong as it is nowhere mentioned in the passage.

Between (a) and (b), when we look at (b), it talks of "ULBs not being efficient enough". But efficiency is not being discussed in the passage, rather financial viability is. **So (b) is not entirely correct.**

So (b) is not entirely correct. **crucial message** being given – "recovering costs through user charges" – which can be a financing mechanism to ensure sustainability of water supply.

[A tough question that needs closer inspection of options.]

35. With 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

Sol. Ans.(b). Theme is "Cost of supplying water".

Statement 1 is not correct, as "rich cities could supply water for free" is mentioned. We are talking of sustainability in statement 1.

Statement 2 is correct as sustainable delivery includes many aspects other than just supplying water to households.

Hence option (b) is right.

[A tricky question, but can be solve with some thought.]

<div align="center">

Passage-5

</div>

In India, agriculture still engages about half of workforce, and about 85 per cent of its farms mall and marginal. Compared to China 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 a 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 5o%. As a result, agri-GDP growth touched 4/1% during 2007-2012 as against 2.4% during 2002—2007. The net surplus or agri-trade touched $25 billion in 2013-2014: real farm wages rose by 7% per annum. All this led to unprecedented fall in poverty.

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

1. Structural and rural transformation is impossible when farms are mainly small arid 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

Sol. Ans.(b). Theme is "Agri prices and poverty reduction".

An excellent topic with great historical background.

Statement 2 is definitely correct (an assumption made in the para) because good price incentives indeed trigger agri investments (mentioned clearly). So options (b) and (c) are only possibilities.

Statement 3 is not mentioned anywhere, even indirectly. So only option (b) is left.

Now statement 4 may look a bit silly when you think of India's poverty reduction being contingent on higher global agri prices. But it is a fact that it does help directly.

[Not an easy one to solve.]

37. 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.

Sol. Ans.(d). Theme is "Agri prices and poverty reduction".

The passage does not talk about 'off-farm rural employment', 'farmer produce companies' or the priority of private investment in agriculture over public. These are not mentioned anywhere at all, and it would be a pure assumption to consider them relevant.

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

The passage clearly implies that the rate of poverty reduction was higher when the growth rate of agri-GDP was more. **Hence option (d) is correct.**

[This was not an easy one to crack!]

38. Two Statements S 1 and S2 are given below with regard to four numbers P, Q, R and S followed by a Question:

S1: R is greater-than P as well as Q.

S2: S is not the largest one.

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.

Sol. Ans.(c).

The question is **'Among four numbers P, Q, R and S, which one is LARGEST?'**

S1 alone is not sufficient to answer the question, as it doesn't talk about S.

S2 alone can't be true as it says that S is not the largest, but doesn't give any hint about R, P and Q.

By combining S1 and S2 we get – 'there are four numbers P, Q, R and S; S cannot be largest; So largest number will be among P, Q and R but 'R is greater than P and Q', so R is the largest.

Hence, answer is (c).

[An easy question based on Data Sufficiency logic. Must be tried.]

39. Two Statements Si 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.

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 S1 alone nor S2 alone is sufficient to answer the Question.
   d. S1 and S2 together are not sufficient to answer the Question.

Sol. Ans.(d).

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 -> 11, 13, 17, and 19.

Using S2 alone there are two numbers 13 (= 4×3 + 1) and 17 (= 4×4 + 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).

[A moderately tough question based on Data Sufficiency logic. May be tried.]

40. 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.

Sol. Ans.(c).

S1 alone gives you a × b = 21 (where a and b are two numbers) which have multiple possibilities like 3×7 = 21, 1.5×14 = 21 or 6 × 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 × b = 21 ...(2)

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

=> a^2 – 7a – 3a +21 = 0 => a(a – 7) – 3 (a – 7) = 0 =>a – 7) (a – 3) = 0

=> 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.]

41. What is the greatest length x such that 3 ½ m and 8 ¾ m are integral multiples of x?

a. 1 ½ m
b. 1 1/3 m
c. 1 ¼ m
d. 1 ¾ m

Sol. Ans.(d).

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

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

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

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

Alternate method –
Here X × Integer = 3 ½ and X × integer = 8 ¾.
So Integer = 3 ½ / X.
Working backward from options 3 ½ / 1 ½ is not an Integer. So option (a) is not possible.
Similarly, options (b) and (c) are not possible.
For option (d), 3 ½ / 1 ¾ = 2 and 8 ¾ / 1 ¾ = 5. So the correct option is (d).

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

42. Consider the following data:

Year	Birthrate	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

Sol. Ans.(d).

Growth rate = Birth rate – Death rate

Growth rate for 1911-1921 = 48.1 – 35.5 = 12.6

Growth rate for 1941-1951 = 39.9 – 27.4 = 12.5

Growth rate for 1961-1971 = 41.1 – 18.9 = 22.2

Growth rate for 1971-1981 = 37.1 – 14.8 = **22.3**

We have to assume the simple formula for natural growth rate, as above, because nothing else is mentioned. And check only for the options given, not all seven years.

[A very simple question that must be attempted.]

43. The recurring decimal representation 1.272727... is equivalent to

a. 13/11
b. 14/11
c. 127/99
d. 137/99

Sol. Ans.(b).

Given that X = 1.272727...

So 100 x = 127.272727...

=>Subtract the first from second, to get – 99 X = 126

=>X = 126/99 = 14/11.

So the correct option is (c).

[If you use the direct method of converting recurring decimals to fractions, then you get 127/99 but that is not exactly 1.27 but closer to 1.28. So if you use 127272727/99999999, it gets closer and closer to 1.272727... So avoid that and go for the method shown, as option (b) is given as 14/11 which is exactly 1.272727.....]

44. 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

Sol. Ans.(b).

Desired number = (Least multiple of four digit of LCM of 3, 4 and 5) + 2

So the LCM of 3, 4, 5 and 6 is 60.

The least 4-digit number divisible by 60 is 1020.

So with remainder 2 it will be 1020 + 2 = 1022. **Answer is (b).**

Alternative method: Work backward from the options and check all the options.

[A direct question based on basic arithmetic]

45. In adult Population or 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. 33 1/7%
   b. 34%
   c. 34 2/7%
   d. 35%

Sol. Ans.(c).

Traditional Method - Let total no. of men = X and Total population be 100.

Total women = (100 – X)

Married men = 40 X/100 ...(i) and Married women = (100 – X) × 30/100 ...(ii)

But, No. of married men = No. of married women. (as per conditions given)

So, from (i) and (ii) X = 300/7

So, married Men = 300/7 X 40/100 = 120/7 and Married women = 120/7.

Total married population = Men + Women = 240/7

Required percentage = 240/7 % = 342/7 %. **So the correct option is (c).**

Alternative method: No man marries more than one woman and no woman marries more than one man. It means the Number of married men = Number of married women = 120 (let). Married adult population = 240.

Number of men = 120×100/40 = 300 and Number of women 120 × 100/30 = 400. So, total population = 300 + 400 = 700.

Required percentage 240×100/700 = = 240/7 % = 342/7 %

(We took 120 due to ease of calculations with given details)

[A tough question that can be left.]

46. 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

Sol. Ans.(a).

When a number is divided by 100, last two digits of that number will always be remainder. For example 312/100 will give 12 as remainder or 5759 will give 59 as remainder.

So our question is basically reduced to find last two digits of 51 × 27 × 35 × 62 × 75.

However, present question can be solved by looking at only unit digit of the above multiplication.

In the multiplication of two numbers, the unit's place of the resultant number always be the product of the unit's place digits of the number which are multiplying. For example, the unit's digit of 51 × 27 will 1 × 7 = 7.

In above we will get unit digit as 1 × 7 × 5 × 2 × 5 = ..0. **Only matching option is (a).**

[A not so easy question based on basics of mathematical operations.]

47. A sum of Rs. 2,500 is distributed among X, Y and Z in the 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

Sol. Ans.(c).

Ratio 1/2 : 3/4 : 5/6 can be written as 6 : 9 : 10.

The total amount is Rs. 2500. Clearly the shares are Rs. 600, Rs. 900 and Rs. 1000 respectively.

The difference between the greatest and the smallest is Rs. 400. So the correct answer is (c).

[A very direct question based on shares and partnerships. Must be attempted.]

48. For what value of it, the sum of digits in the number (10n + 1) is 2?

a. For n= 0 only
b. For any whole number n
c. For any positive integer n only
d. For any read number n

Sol. Ans.(b).

$(10^n + 1)$ will have sum of digits 2 for any **whole number** n. Whole numbers are integers starting with 0. Just put different value of n and observe yourself.

For n = 0, $10^0 + 1 = 1 + 1$. So sum is 2.

For n = 1, $10^1 + 1 = 11$. So sum is 1 + 1 = 2.

For n = 2, $10^2 + 1 = 100 + 1 = 101$. So sum is 1 + 1 = 2.

So the correct option is (b).

[A very easy question that can be solved by direct substitution.]

49. 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. It decreases.
c. It remains the same.
d. No conclusion can be drawn due to insufficient data.

Sol. Ans.(c).

Class Average will remain same as nobody is coming in or going out of the class. So **average weight equilibrium** will be same as before shifting. A change can happen only if someone is added to the group(s) or someone leaves the group(s), not otherwise.

[A direct logical question, worth attempting!]

50. How many different sums can be formed with the denominations 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

Sol. Ans.(a).

We have to choose at least three denominations out of five. So we can either choose 3 denominations out of 5 or choose 4 out of 5 or choose all 5.

Mathematically it will be written as –

Total number of ways = ⁵C₃ + ⁵C₄ + ⁵C₅ = 10 + 5 + 1 = 16 ways.

Don't worry about **'different sums',** they will be 'different' as each time we are taking a different set of denominations.

Manually, these combinations will be –

(a) Three denomination combinations –

50+100+200; 50+100+500; 50+100+2000; 50+200+500; 50+200+2000; 50+500+2000; 100+200+500; 100+200+2000; 100+500+2000; 200+500+2000; **TOTAL 10**

(b) Four denomination combinations –

50+100+200+500;   50+100+200+2000;   50+100+500+2000;   50+200+500+2000; 100+200+500+2000; **TOTAL 5**

(c) Five denomination combinations –

50+100+200+500+2000; **TOTAL 1**

So total = 10 + 5 + 1 = 16.

[You can either do it manually, or use the theory of permutations and combinations to crack it.]

51.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 be completed?

   a. 6
   b. 8
   c. 10
   d. 12

Sol. Ans.(a).

Regular method:

X can complete 20% of the work in 8 days. So X can complete the entire work in 40 days. Thus, work done by X in 1 day = 1/40.

Y can complete 25% of the same work in 6 days. So work entire work in 24 days and work done by Y in 1 day = 1/24.

Work done by X and Y in 1 day = 1/40 + 1/24 = 8/120 = 1/15.

That means X and Y can together complete the entire work in 15 days.

So, time taken to finish 40% or 2/5th of the work = 15 × 2/5 = 6 days. **So the correct option is (a).**

Alternative method:

X can complete 20% of the work in 8 days so he will complete 40% of the work in 16 days or 48/3 days.

Y can complete 25% of the work in 6 days so he will complete 40% of the work in 6×40/25 = 48/5 days.

If both work together, the work will be completed in 1/(5/48+3/48)=1/(8/48)=1/(1/6)=6 days

[A standard question from Work and Time, but slightly tricky.]

52. 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

Sol. Ans.(b).

Regular Method: Average Speed = Total distance ÷ Total time.

Let us assume that distance between X and Y be 'a'. Then, total distance = a + a + a + a = 4a.

And total time = Distance/Speed = a/v + a/2v + a/3v +a/4v = 25a/12v

So, average speed for the entire journey = 4a/ (25a/12v) = 48v/25 = 1 .92v.

So the correct option is (b) i.e. between v and 2v.

Short-cut method: If same distance is travelled four times with different speeds say a kmph, b kmph, c kmph and d kmph, then Average Speed of total journey can be given by 4abcd/(abc+abd+acd+bcd).

By putting the value directly in formula we get

$$\frac{4 \times v \times 2v \times 3v \times 4v}{(v \times 2v \times 3v)+(v \times 2v \times 4v)+(v \times 3v \times 4v)+(2v \times 3v \times 4v)} = \frac{96v^4}{6v^3+8v^3+12v^3+24v^3} = \frac{96v^4}{50V^3} = \frac{48v}{25} = 1.92 \text{ v.}$$

[A not so easy question that may be dropped]

**53.** 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 a 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

Sol. Ans.(c).

As shown in figure, minimum numbers of points of intersection of a square and a circle is 2 and maximum number of points of intersection is 8.
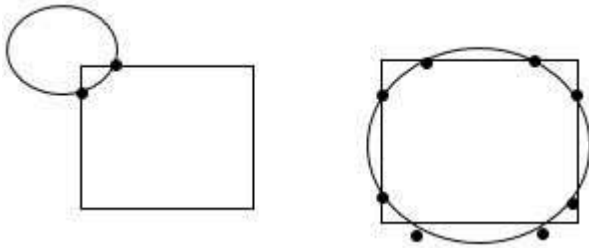
So both statements are correct.

[A completely logical question from geometry. Must be tried!]

54. A man takes half time in rowing a certain distance downstream than upstream. What is the ratio or the speed in still water to the speed of current?

a. 1 : 2
b. 2 : 1
c. 1 : 3
d. 3 : 1

Sol. Ans.(d).

Regular method: Let the speed in still water = s kmph and the speed of current = c kmph. Let distance is D km.

Speed upstream = Speed in still water + Speed of current = s + c.

Speed downstream = Speed in still water – Speed of current = s – c.

Time upstream = Distance/Speed upstream = D/(s –c) ...(1) and

Time downstream = Distance/Speed downstream = D/(s+c) ...(2)

By the condition given in question Time upstream/2 = Time downstream

So $\frac{1}{2} \times \frac{D}{(s-c)} = \frac{D}{(s+c)} \Rightarrow s+c = 2(s-c) \Rightarrow s+c = 2s - 2c \Rightarrow 3c = s \Rightarrow \frac{s}{c} = 3$ or $\frac{s}{c} = 3 : 1$.

Shortcut method: Try working backwards. For option (d), s = 3x, c = 1x. So downstream speed = 4x and upstream speed = 2x. Clearly for the same distance, ratio of times taken will be ratio of these speeds, and that comes out to 4x : 2x = 2:1. (upstream time : downstream time). **Hence option (d) is correct.**

[A simple question from Boats and Streams. Must be attempted.]

55. 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

Sol. Ans.(a).

Natural numbers are integers starting with 1.

Let the two numbers be a and b then

$a^2 - b^2 = 63 =>(a + b) (a - b) = 63$. Now $63 = 9 \times 7 = 21 \times 3 = 63 \times 1$ So,

Case I: $a + b = 9$; $a - b = 7$. Here we will get $a = 8$ and $b = 1$

Case II: $a + b = 21$; $a - b = 3$. Here we will get $a = 12$ and $b = 9$.

Case III: $a + b = 63$; $a - b = 1$. Here we will get $a = 32$ and $b = 31$

Since 63 has only these 3 pairs of factors, **so the correct option is (a).**

[A good question based on basic number theory; may be attempted.]

56. Which one of the following will have minimum change in its value if s 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

Sol. Ans.(d).

Conceptual Method - All the given fractions are in the form of $\frac{a}{a+1}$. Let d is added to both numerator and denominator. So new fraction will be $\frac{a+d}{a+d+1}$.

$$\text{Percentage change} = \frac{\left(\frac{a+d}{a+d+1} - \frac{a}{a+1}\right) \times 100}{\frac{a}{a+1}} = \frac{\{(a+d)(a+1) - 2(a+d+1)\}}{(a+d+1)(a+1)} \times \frac{(a+1) \times 100}{a} = \frac{d \times 100}{a+d+1}.$$

Value of this percent will depend on 'a'. As numerator is a constant value and 'a' is in denominator, the higher the value will be the shorter the percentage will be. Hence correct option is (d).

Otherwise you can try it by direct method. . How? Of all given fractions, the largest is 5/6 = 83.3%. Rest all are smaller. So the largest will show the minimum impact of this operation.

[A good but not so easy question on basic numbers.]

57. 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

Sol. Ans.(d).

A digit n > 3 is divisible by 3 but not divisible by 6 is 9.

So n = 9. Of all given options 2n, 3n, 2n+4, and 3n + 1, only the last one (= 3×9 + 1 = 28) will be divisible by 4.

[A direct question that must be solved.]

58. If 1 litre of water weighs 1 kg, then how many cubic millimeters of water will weigh 0.1 gm?

a. 1
b. 10
c. 100
d. 1000

Sol. Ans.(c).

Given 1 litre = 1 kg.

We know that 1 m^3 (1 cubic metre) is exactly 1000 Litres.

=>1000 litre = 109 cubic millimetres.

(How? 1 m x 1 m x 1 m = 100 cm x 100 cm x 100 cm = 1000 mm x 1000 mm x 1000 mm = 10^9 mm^3)

=>1 litre = 10^6 cubic millimetres = 1 kg = 1000 gm

So 0.1 gram = 10^2 mm^3 = 100 cubic millimetres.

[Slightly involved calculations, though from the first principles only.]

59. A vessel full of water weighs 4o kg. If it 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

Sol. Ans.(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 .... (1) and

v + w/3 = 20 .... (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]

60. 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

Sol. Ans.(b).

Total distance to be jumped by frog to come out = 4.5 m = 450 cm.

Frog jumps 30 cm and slips 15 cm, which means that, in a jump he ascends 30 – 15 = 15 cm.

In 28 such jumps he will ascend to 28 × 15 = 420 cm.

Now only 30 cm remain to come out, which the frog will jump in the next (29th) jump.

Note – In the last jump frog will not slip because he will be outside the well.

[A nice question using logical reasoning.]

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

Spanish ships in the late 16th century first brought the potato tuber from South America to Europe whereby in the early 19th century, it bad 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.

61. Which one or the following statements best reflects the critical message or 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 or the fungal infections or plants cannot be prevented or stopped from spreading across large areas.
d. Relying on a homogeneous food source is not desirable.

Sol. Ans.(d). 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.**

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

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 or their healthy peers.

62. 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

Sol. Ans.(c). 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

The pulse variety 'Pusa Arhar 16' has the potential to be grown in the paddy-growing 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 arid 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. AU 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.

63. 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.
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

Sol. Ans.(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

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 or 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.

64. 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 hydro power 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

Sol. Ans.(c). 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]

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 quiet 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.

65. 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

Sol. Ans.(a). Theme is "Economic liberalization in India". There are two questions, so must be attempted.

We are asked to find which on is a rational and logical inference.

Statement 1 speaks about rethinking the economic role of State, in the quest for development. From the passage, it is clear that the Indian liberalization process was triggered by government's economic problems and not people's problems, and that led to many design flaws, which are now visible in multiple shortcomings across sectors.

So, 1 does seem a rational inference. The State's economic role must be rethought and redefined if we want proper development. **So answer can be (a) or (c).**

Statement 2 talks about "implementation of policies" and "insufficient investments". It is difficult to infer this from the para that speaks mostly of "conception and design" and not "implementation". Also the term 'social sectors' is not defined. **Hence final answer is (a).**

[A difficult one, to be handled with care.]

66. 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

Sol. Ans.(d). Second question on same set. Theme is "Economic liberalization in India".

A mere glance at both the statements 1 and 2 shows that both are not valid at all.

The passage hasn't talked about integration of Indian economy with the global economy. It also hasn't talked about potentially high growth being the driver of bringing economic liberalization in India (which the second statement is hinting at). Hence 2 is also wrong.

Hence answer is (d).

[An easy question, must be attempted.]

67. A shop owner offers the following discount options on an article to a customer:

1. Successive discounts or 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 or 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.

Sol. Ans.(d). All the options are equally good for the customer.

Case 1 –Let the price of the article = 100, after first discount of 10% it will be of 90. After second discount of 20% it will be 90 – 18 (20% of 90) = 72. And after services tax, it will become 72 – 7.2 (10% of 72) = **64.8.**

Case 2 Let the price of the article = 100, after first discount of 20% it will be of 80. After second discount of 10% it will be 80 – 8 (10% of 80) = 72. And after services tax, it will become 72 – 7.2 (10% of 72) = **= 64.8.**

Case 3 Let the price of the article = 100, after 10% service it will be of 90. After second discount of 20% it will be 90 – 18 (20% of 90) = 72. And after the last discount of 10% it will become 72 – 7.2 (10% of 72) = **64.8.**

[A good question, based on simple profit and loss topic. Must be attempted.]

68. 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

Sol. Ans.(d).

It is given that A to Z are numbered in same order as 1 to 26 (the word "respectively").

Now, GHI must logically become 789. But we are given GHI = 1578.

Note that 789 x 2 = 1578.

Also given that DEF = 912. But 912 = 456 x 2 and 456 = DEF in the given coding scheme.

So logic is "doubling of give number code".

So correct answer would be ABC = 123 = 246.

[A slightly tricky question on coding, but can be done.]

69. What is the missing term in the following?

ACPQ : BESU:: MNGI: @

a. NPJL
b. NOJM

c. NPIL
d. NPJM

Sol. Ans.(d).

ACPQ : BESU :: MNGI : @

Here A + 1 = B; C + 2 = E; P + 3 = S; Q + 4 = U (So ACPQ becomes BESU)

Similarly, M + 1 = N; N + 2 = P; G + 3 = J; I + 4 = M.

So the correct option is (d) as MNGI will become NPJM.

[A direct question on coding, and must be attempted.]

70.what is the largest number among the following?

<

a. $(1/2)-6$
b. $(1/4)-3$
c. $(1/3)-4$
d. $(1/6)-2$

Sol. Ans.(c).

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

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

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

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

So the correct option is (c).

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

Directions for the following 6 (six) items:

Read the following five passages and answer 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 no proper system to shut them down. Weak loss-making banks continue to need more capital.

71. 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 mechanism 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.

Sol. Ans.(c). Theme is "Failing banks and resolution process".

The passage is focused on the limitations of the way the Indian banking system is structured, as banks are not allowed to fail, and there is no formal resolution process for that.

Option (a) is too broad.

Option (b) is too generalized.

Option (c) is precise and the actual inference we can draw.

Option (d) is irrelevant.

[An easy question, must do.]

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 percent 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.

72. 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.

Sol. Ans.(c). Theme is "India's emissions and renewables push".

The passage says that 'India has potential for solar energy. We have decided to shift to renewable sources of energy but they are costly and technologically not perfect. Indian government is committed to reduce emission by 33% till 2030 and for that it has made efforts in gas-based economy and renewable energy fields. **Business-houses are reluctant to invest in renewable energy sources because of lack of technology.'**

The passage does not provide comparison of gas over renewable sources, and definitely does not say that gas must be preferred over renewables. **So (b) is clearly ruled out.**

Similarly, option (d) sounds like a policy prescription that's not intended, in the passage.

So between (a) and (c), it is a tough choice. We will go with (c).

[A tough one.]

73. 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

Sol. Ans.(d). Second question on the same passage. Theme is "India's emissions and renewables push".

Passage does not talk about subsidies. In fact it is talking of investment from corporates. So statement 1 can be ruled out. **So options (a) and (c) are ruled out.**

Statement 2 is only slightly correct, because it sounds almost like a foregone conclusion. This is 2020, and we are talking about 2030. So things can change in the meantime. So, 2 may not be entirely right.

So we reject 2 also. **Hence answer is (d).**

[A tough one.]

74. 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

Sol. Ans.(c). Theme is "Genome editing".

Both the assumptions are valid.

Statement 1 is evident from 'Researchers use 'molecular scissors' to dissect the genome and repair it..'.

Statement 2 looks like the summary of the passage. It is correct.

Hence answer is (c).

[A very easy one.]

Passage — 4

Many people understand the connection n solid waste management and health in terms of the consequences of unattended heaps of 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.

75. In the context of India, which one of the following statements best reflects the eritical 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 or 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.

Sol. Ans.(c). Theme is "Solid waste management".

The passage does not talk about 'resources of urban local bodies' and 'drinking water shortage', **so (b) and (d) are ruled out.**

Between (a) and (c), option (c) is evident from '... when unscientific solid waste management combines with poor drainage..'. **So correct answer is option (c).**

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, practice 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 Ill over and above the right to religious freedom. Among those other fundamental rights is the rights 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.

76. 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.

Sol. Ans.(b). Theme is "Freedom of Religion u/Art 25".

The passage wants to say that our constitution provides the fundamental right of religious freedom with certain conditions. If it is harmful for the society in any way, the state can intervene.

Options (c) and (d) are both extreme and can be immediately rejected.

Option (a) is not correct at all.

[A relatively easy question.]

77. 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

Sol. Ans.(d).

D _ _ _ I

We have three places and three letters E, H, L which can be arranged in 3! = 6 ways.

So the correct option is (d). This is a question from permutations and combinations. If you don't know the topic, you can try doing it manually as well which may take some time.

[An easy question if you knew the topic.]

78.A bottle contains 20 litres of liquid A. 4 litres of liquid A is taken out of it d replaced by same quantity of liquid B. Again 4 litre 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

Sol. Ans.(c). Successive replacement case – If y units of some other liquid is replaced in x units of original liquid n times then the ratio of the **quantity of original liquid** to the **total quantity of liquid** after n operation = $((x-y)/x)^n$.

Applying to our case x = 20, y = 4, n = 2.

So at the end of the 2nd operation the ratio of the quantity of liquid A to the total quantity of liquid =

$$\left(\frac{20-4}{20}\right)^2 = \left(\frac{16}{20}\right)^2 = \left(\frac{4}{5}\right)^2 = \frac{16}{25}.$$

It means out of the total quantity of 25 units liquid A is 16 units and liquid B is 26 – 16 = 9 units.

Hence required ratio is 16 : 9.

[Knowing the formula helps a lot in this.]

79. 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

Sol. Ans.(c).

Regular method: Average of 50 innings = 46.4.

Sum of 50 innings = 50 × 46.4 = 2320 ...(i)

Average of 60 innings = 46.4 + 2.6 = 49

Sum of 60 innings = 60 × 49 = 2940 ...(ii)

So runs scored in last ten innings = 2940 – 2320 = 620.

Average = 620/10 = 62. **So the correct option is (c).**

Short-cut: The runs scored in last ten innings increase the average of all 60 innings. It means that in last ten innings 2.6×60 more runs were scored.

So, in last ten innings total runs scored = 10 × 46.4 (previous average) + extra runs which caused the increase in the average of all 60 innings

= (10 × 46.4) + (2.6 × 60) = 464 + 156 = 620.

So required average 620/10 = 62.

[A tough question on averages, which can be avoided in the first round of solving.]

80. 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

Sol. Ans.(b).

Start directly from the options.

Option (a) – Rs.30. Hike it by 25% and it becomes Rs.37.5 per kg. Originally one could buy (1200 / 30) = 40 kg rice and now one can buy (1200 / 37.5) = 32 kg. Difference is 8 kg and not 6 kgs.

Option (b) – Rs.40. Hike it by 25% and it becomes Rs.50 per kg. Originally one could buy (1200 / 40) = 30 kg rice and now one can buy (1200 / 50) = 24 kg. . **Difference is 6 kg and (b) is our answer.**

Other method: Let the original price be P. So, 1.25 P is the new price.

Earlier quantity purchased = 1200 / P kg.

New quantity purchased = 1200 / 1.25P kg

Difference = 6 kg = 1200/P – 1200/1.25P.

Solve for P.

[A tricky question in CP/SP/Percentages but can be cracked from options easily.]