CIVIL SERVICES PRELIMINARY

EXAMINATION (CSE) 2022

GS (Paper-II)
CSAT Answer Key with Explanation

Question Booklet Version **A**

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Directions for the following 3 (three) items:

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

Passage - 1

The main threat to maintaining progress in human development comes from the increasingly evident unsustainability of production and consumption patterns. Current production models rely heavily on fossil fuels. We now know that this is unsustainable because the resources are finite. The close link between economic growth and greenhouse gas emissions needs to be severed for human development to become truly sustainable. Some developed countries have begun to alleviate the worst effects by expanding recycling and investing in public transport and infrastructure. But most developing countries are hampered by the high costs and low availability of clean energy sources. Developed countries need to support developing countries transition to sustainable human development.

1. **Unsustainability in production pattern is due to which of the following?**
1. Heavy dependence on fossil fuels
2. Limited availability of resources
3. Expansion of recycling

Select the correct answer using the code given below.

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

Ans : (a)

Exp : Statement 1 and 2 are correct because they are supported by second and third lines respectively. But third statement goes against the message of the passage. Thus, option (a) is correct answer.

2. **Consider the following statements :**

Developed countries can support developing countries transition to sustainable human development by
1. making clean energy sources avaliable at low cost.
2. providing loans for improving their public transport at nominal interest rates.
3. encouraging them to change their production and consumption patterns.

Which of the statements given above is/are correct?

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

Ans : (a)

Exp : Statement 1 is correct because last two lines of the passage support it. However, there is not such clear support to 2nd and 3rd statements. Thus, option (a) is correct answer.

Passage - 2

Unless the forces and tendencies which are responsible for destroying the country's environment are checked in the near future and afforestation of denuded areas is taken up on a massive scale, the harshness of the climatic conditions and soil erosion by wind and water will increase to such an extent that agriculture, which is the mainstay of our people, will gradually become impossible. The desert countries of the world and our own desert areas in Rajasthan are a grim reminder of the consequences of large-scale deforestation. Pockets of desert-like landscape are now appearing in other parts of the country including the Sutlej-Ganga Plains and the Deccan Plateau. Where only a few decades back there used to be lush green forests with perennial streams and springs, there is only brown earth, bare of vegetation, without any water in the streams and springs except in the rainy season.

3. **According to the passage given above, deforestation and denudation will ultimately lead to which of the following?**

1. Depletion of soil resource
2. Shortage of land for the common man
3. Lack of water for cultivation

Select the correct answer using the code given below.

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

Ans : (c)

Exp : Statement 1 and 3 are correct because the passage mentions erosion of soil due to denudation and disappearing water in the streams except in rainy season. Statement 2 is vague because what kind of land will be in shortage is not clear. Thus, option (c) is correct answer.

4. **What is the value of X in the sequence 20, 10, 10, 15, 30, 75, X?**

(a) 105
(b) 120
(c) 150
(d) 225

Ans : (d)

Exp : Following is the sequence followed by given series,

$$20 \xrightarrow{\times 0.5} 10 \xrightarrow{\times 1} 10 \xrightarrow{\times 1.5} 15 \xrightarrow{\times 2} 30 \xrightarrow{\times 2.5} 75 \xrightarrow{\times 3} \boxed{225}^{x}$$

Hence, the option (d) i.e. value of x is 225.

5. **An Identity Card has the number ABCDEFG, not necessarily in that order, where each letter represents a distinct digit (1, 2, 4, 5, 7, 8, 9 only). The number is divisible by 9. After deleting the first digit from the right, the resulting number is divisible by 6. After deleting two digits from the right of original number, the resulting number is divisible by 5. After deleting three digits from the right of original number, the resulting number is divisible by 4. After deleting four digits from the right of original number, the resulting number is divisible by 3. After deleting five digits from the right of original number, the resulting number is divisible by 2. Which of the following is a possible value for the sum of the middle three digits of the number?**

(a) 8
(b) 9
(c) 11
(d) 12

Ans : (a)

Exp : As given, identity card number is a 7 digit number and each letter represents a distinct digit i.e. 1, 2, 4, 5, 7, 8, 9 only

According to the divisiblity test of 5, the fifth digit of the given number is 0 or 5. but as given 0 is not there in the number. Thus fifth digit of the number should be '5'

```
 2   1   2       2
 4   7   4       4
 8   9   8   5   8
___ ___ ___ ___ ___ ___
     A   B   C
```

Now according to the divisibility test of 2, 4 and 6, the digits at the 2nd, 4th and 6th place should be even numbers and the possible values are 2, 4 or 8 and thus digit at 3rd place should be an odd number i.e. any digit from 1, 7 or 9. Now let, A, B and C be the third, fourth and fifth digit of the number. We know that C = 5. So, by using option elimination method we can say that,

Option (a) = A + B + C = 8 i.e. A + B = (8 - 5) = 3

So possible values of A and B = 1 and 2

Option (b) = A + B + C = 9 i.e. A + B = (9 - 5) = 4

None of the combination of remaining digits satisfies the above condition. Hence, option (b) is incorrect.

Option (c) = A + B + C = 11 i.e. A + B = (11 - 5) = 6

Hence, the possible combination is 2 and 4 but the digit at 3rd position should be either 1, 7 or 9. So, this is not the correct answer.

Option (d) = A + B + C = 12 i.e. A + B = (12 - 5) = 7

None of the combination of remaining digit satisfies the above condition. Hence option (d) is incorrect.

From above, option (a) i.e. A + B + C = 1 + 2 + 5 = 8 is the correct answer.

6. **Two friends X and Y start running and they run together for 50 m in the same direction and reach a point. X turns right and runs 60 m. Then X turns left and runs 50 m and stops, while Y turns right and runs 50 m and then stops. How far are the two friends from each other now?**
    (a) 100 m
    (b) 90 m
    (c) 60 m
    (d) 50 m

Ans : (a)

Exp : As given, the path of their running will be follows :
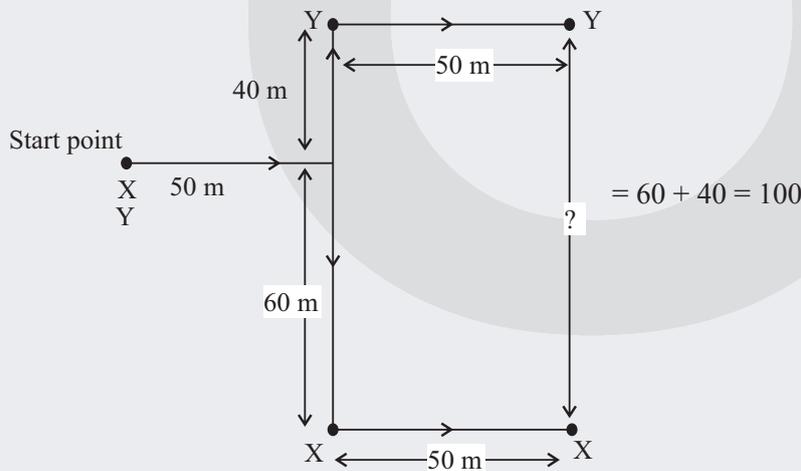
From the above diagram, the distance between two friends is 100m.
Hence, option (a) is correct answer.

7. **Which date of June 2099 among the following is Sunday?**
    (a) 4
    (b) 5
    (c) 6
    (d) 7

Ans : (d)

Exp : First we will find the day on 1.06.2099

1.06.2009 = (2000 years + 98 years + period from 1.01.2099 to 1.06.2099)

Odd days in 400 years = (5 × 4 + 1) = 0

Similarly odd days in 2000 years = 0

Odd days in 98 years   = [24 leap years + 74 ordinary years]

$$= [(2 \times 24) + (1 \times 74)]$$
$$= 48 + 74$$
$$= 122 \text{ odd days}$$
$$= 17 \text{ weeks} + 3 \text{ days}$$
$$= 3 \text{ odd days}$$

Odd days from 1.01.2099 to 1.06.2099 = Jan + Feb + March + April + May + June
$$= 31 + 28 + 31 + 30 + 31 + 1$$
$$= 157$$
$$= 21 \text{ weeks} + 5 \text{ days}$$
$$= 5 \text{ odd days}$$

Total number of odd days = (0 + 3 + 5) = 8 days = 1 odd days

Hence, Monday lies on 1.06.2099 and Sunday will fall on 7th.

Thus, option (d) is correct answer.

8. **A bill for ₹ 1,840 is paid in the denominations of ₹ 50, ₹ 20 and ₹ 10 notes. ₹ 50 notes in all are used.**
   Consider the following statements :
   1. ₹ 25 notes of ₹ 50 are used and the remaining are in the denominations of ₹ 20 and ₹ 10.
   2. ₹ 35 notes of ₹ 20 are used and the remaining are in the denominations of ₹ 50 and ₹ 10.
   3. ₹ 20 notes of ₹ 10 are used and the remaining are in the denominations of ₹ 50 and ₹ 20.
   Which of the above statements are not correct?
   (a) 1 and 2 only
   (b) 2 and 3 only
   (c) 1 and 3 only
   (d) 1, 2 and 3

Ans : (d)

Exp : As given,

$(50 \times x) + (20 \times y) + (10 \times z) = 1,840$

$x + y + z = 50$ .... (1)

Here, x, y and z are the number of notes used of denominations ₹ 50, ₹ 20, ₹10 respectively.

1st statement :

$(50 \times 25) + 20y + 10z = 1840$

$20y + 10z = 1849 - 1250 = 590$

$20y + 10z = 590$ .... (2)

By solving equation (1) and (2) we get

$$\begin{array}{r} 20y + 10z = 590 \\ - \quad 10y + 10z = 250 \\ \hline 10y = 340 \end{array}$$ .... $[\because y + z = 50 - 25]$

$\therefore y = 34$

As we know according to statement (1), y + z = 25

Thus statement (1) is not correct.

2nd statement :

$50x + (20 \times 35) + 10z = 1840$

$50x + 10z = 1840 - 700$

$50x + 10z = 1140$ .... (3)

By solving equation (1) and (3) we get

$$\begin{array}{r} 50x + 10z = 1140 \\ - \quad 10x - 10z = (15 \times 10) \\ \hline 40x = 990 \end{array}$$

$x = 24.75$

From above it is clear that value of x does not satisfy the given condition i.e.

$x + z = (50 - 35) = 15$.

Hence, statement (2) in incorrect.

3rd statement :

$50x + 20y + (10 \times 20) = 1840$

$50x + 20y = 1840 - 200$

By solving equation (1) and (4) we get,

$$\begin{array}{r} 50x + 20y = 1640 \\ -\quad 20x + 20y = 600 \\ \hline 30x = 1040 \end{array}$$ .... $(x + y = 30)$

$x = 34.66$

Where as according to statement (3), $x + y = 30$.

Hence statement (3) is incorrect

Hence, option (d) is the correct answer.

9. **Which number amongst 2^{40}, 3^{21}, 4^{18} and 8^{12} is the smallest?**

   (a) 2^{40}

   (b) 3^{21}

   (c) 4^{18}

   (d) 8^{12}

Ans : (b)

Exp : As given,

$2^{40} = 2^{40}$

$3^{21} = (3^7)^3 = (2187)^3$

$4^{18} = (2^2)^{18} = (2)^{36} = (2^{12})^3 = (4096)^3$

$8^{12} = (2^3)^{12} = (2)^{36} = (2^{12})^3 = (4096)^3$

From above, option (b) is the correct answer.

10. **The digits 1 to 9 are arranged in three rows in such a way that each row contains three digits, and the number formed in the second row is twice the number formed in thr first row; and the number formed in the third row is thrice the number formed in the first row. Repetition of digits is not allowed. If only three of the four digits 2, 3, 7 and 9 are allowed to use in the first row, how many such combinations are possible to be arranged in the three rows?**

   (a) 4

   (b) 3

   (c) 2

   (d) 1

Ans : (c)

Exp : As per given condition let's verify the possible combinations.

In row 1, digit 9 and 7 cannot be at first position as it will gives us 4 digit number at row 2 and row 3. Which does not satisfy the given condition. Hence, possible combination to verify are $2 \times 3 \times 2 = 12$

Row 1 (a)	Row 2 (a × 2)	Row 3 (a × 3)	Whether satisfies all given conditions Yes/No
237	747	711	No
273	546	819	Yes
327	654	981	Yes
372	744	1116	No
239	478	717	No
293	586	879	No
329	658	987	No
392	784	1176	No
279	558	837	No
297	594	891	No
379	758	1137	No
397	794	1191	No

From above table it is clear that out of 12 conditions only 2 combinations satisfies all the given condition. Hence,

option (c) is the correct answer.

Directions for the following 4 (four) items:

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

Passage - 1

"In simple matters like shoe-making we think only a specially trained person will serve our purpose, but in politics, we presume that everyone who knows how to get votes knows how to administer a State. When we are ill, we call for a trained physician, whose degree is a guarantee of specific preparation and technical competence - we do not ask for the handsomest physician, or the most eloquent one : well then, when the whole State is ill should we not look for the service and guidance of the wisest and the best?"

11. **Which one of the following statements best reflects the message of the author of the passage?**

(a) We assume that in a democracy, any politician is qualified to administer a State.

(b) Politicians should be selected from those trained in administration.

(c) We need to devise a method of barring incompetence from public office.

(d) As voters select their administrators, a State cannot be questioned.

Ans : (c)

Exp : Option (a) is incorrect because of the word 'any'. Option (b) is incorrect because 'trained for administration' is too specific and is different than 'to know how to administer a state.' Option (d) is incorrect because it has no basis. Option (c) is correct because the passage says we should look for the wisest and the best politicians who have competence. For that we have to focus on competent people and prevent incompetent people from entering the public office. Thus, option (c) is correct answer.

Passage - 2

The poverty line is quite unsatisfactory when it comes to grasping the extent of poverty in India. It is not only because of its extremely narrow definition of 'who is poor' and the debatable methodology used to cunt the poor, but also because of a more fundamental assumption underlying it. It exclusively relies on the notion of poverty as insufficient income or insufficient purchasing power. One can better categorize it by calling it income poverty. If poverty is ultimately about deprivations affecting human well-being, then income poverty is only one aspect of it. Poverty of a life, in our view, lies not merely in the impoverished state in which the person actually lives, but also in the lack of real opportunity given by social constraints as well as personal circumstances - to choose other types of living. Even the relevance of low incomes, meagre possessions, and other aspects of what are standardly seen as economic poverty relate ultimately to their role in curtailing capabilities i.e. their role in severely restricting the choices people have to lead variable and valued lives.

12. **Why is the methodology adopted in India to count the 'poor' debatable?**

(a) There is some confusion regarding what should constitute the 'poverty line.'

(b) There are wide diversities in the condition of the rural and urban poor.

(c) There is no uniform global standard for measuring income poverty.

(d) It is based on the proposition of poverty as meagre income or buying capacity.

Ans : (d)

Exp : Option (a), (b) and (c) are incorrect as they do not have basis in the passage. Option (d) is correct because it is supported by 2nd, 3rd and 4th statements of the passage.

13. **Why is income poverty only one measure of counting the 'poor'?**

(a) It talks of only one kind of deprivation ignoring all others.

(b) Other deprivations in a human life have nothing to do with lack of purchasing power.

(c) Income poverty is not a permanent condition, it changes from time to time.

(d) Income poverty restricts human choices only at a point of time.

Ans : (a)

Exp : Option (b) is too extreme to be correct. Option (c) is incorrect because it has no basis in the passage. Same is the case with option (d) and thus it is incorrect. Option (a) is correct because the passage tells that the concept of 'income poverty' is only one aspect of poverty and other aspects are not taken into account by this concept. Thus, option (a) is correct answer.

14.   What does the author mean by 'poverty of a life'?
(a) All deprivations in a human life which stem not only from lack of income but lack of real opportunities.
(b) Impoverished state of poor people in rural and urban areas.
(c) Missed opportunities in diverse personal circumstances
(d) Material as well as non-material deprivations in a human life which restrict human choices permanently.

Ans : (a)

Exp : Option (a) is correct answer because it is supported by the second last line of the passage. Options (b), (c) and (d) do not have basis in the passage. Thus, they are incorrect. Thus, option (a) is correct answer.

15.   X and Y run a 3 km race along a circular course of length 300 m. Their speeds are in the ratio 3 : 2. If they start together in the same direction, how many times would the first one pass the other (the start-off is not counted as passing)/
(a) 2
(b) 3
(c) 4
(d) 5

Ans : (b)

Exp : Since, X and Y move in the same direction along the circle and start-off is not counted as passing, so they will first meet each other at the starting point when X completes his 3rd round and Y completes his 2nd round. Thus, for every 3rd round X passes Y.

To complete the 3km race, X requires 10 rounds, thus along the circular course of length 300m, X will pass

$Y = \dfrac{10}{3} \cong 3$ times during his total journey.

Hence, option (b) is the correct answer.

16.   If the order of the letters in the English alphabet is reversed and each letter represents the letter whose position it occupies, then which one of the following represents 'LUCKNOW?'
(a) OGXPMLD
(b) OGXQMLE
(c) OFXPMLE
(d) OFXPMLD

Ans : (d)

Exp : As per given condition we can write,
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
↓
Z Y X̲ W V U T S R Q P O N M L K J I H G F̲ E D̲ C B A
From above table we can write 'LUCKNOW' as 'OFXPMLD'
Hence, option (d) is the correct answer.

17.   In a tournament of Chess having 150 entrants, a player is eliminated whenever he loses a match. It is given that no match results in a tie/draw. How many matches are played in the entire tournament?
(a) 151
(b) 150
(c) 149
(d) 148

Ans : (c)

Exp : As given there are 150 entrants and a player is eliminated whenever he loses a match.
Here 1 entrant is a winner and remaining 149 entrants lose their match. To lose the match 149 entrants should play the 149 matches.
Hence, total number of matches played in the entire tournament are 149. Thus, option (c) is the correct answer.

18.   How many 3-digit natural numbers (without repetition of digits) are there such that each digit is odd and the number is divisible by 5?
(a) 8
(b) 12
(c) 16
(d) 24

Ans : (b)

Exp : According to give condition 3 digit natural number should consist of digit 1, 3, 5, 7 and 9 odd numbers.

As per second condition number c's divisible by 5, thus 3rd digit of the number must be 5.

Possible combination for 3rd position of number is '1'

Now any digit from 1, 3, 7, 9 will be at 1st position of the 3-digit natural number, thus possible combinatons for 1st position are '4'.

Hence, possible combinations for 2nd position are '3'

Total combinations of such 3-digit natural numbers

$= 4 \times 3 \times 1$

$= 12$

Hence, option (b) is the correct answer.

19. **Consider the Question and two Statements given below :**

Question : Is x an integer?

Statement : x/3 is not an integer.

Statement : 3x is an integer.

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

(a) Statement - 1 alone is sufficient to answer the Question

(b) Statement - 2 alone is sufficient to answer the Question.

(c) Both Statement -1 and Statement -2 are sufficient to answer the Question

(d) Both Statement -1 and Statement -2 are not sufficient to answer the Question.

Ans : (d)

Exp : For statement 1 :

Let's take value of x as 1/3 which is not an integer then

$$\frac{x}{3} = \frac{\frac{1}{3}}{3} = \frac{1}{9}$$

Here, $\frac{x}{3}$ is not an integer.

And for $x = 1$, $\frac{x}{3} = \frac{1}{3}$ i.e. $\frac{x}{3}$ is not an integer but x is an integer.

Thus, statement 1 alone is not sufficient to say that x is an integer.

For statement 2 :

For $x = \frac{1}{3}$ (not an integer), $3x = 3 \times \frac{1}{3} = 1$ i.e. $3x$ is an integer and for $x = 1$ (integer), $3x = 3 \ 1 = 3$ i.e. $3x$ is an

integer. Thus statement 2 alone is not sufficient to say that x is an integer.

But by using both the statement 1 and 2 we can say that x is an integer for $x = 1$

$\frac{x}{3}$ i.e. $\frac{1}{3}$ is an integer

and $3x = 3 \times 1$ is an integer.

Same thing can be said about $x = \frac{1}{3}$

Thus to answer the question both the statement are not sufficient. Hence, option (d) is the correct answer.

20. **The increase in the price of a certain item was 25%. Then the price was decreased by 20% and then again increased by 10%. What is the resultant increase in the price?**

(a) 5%

(b) 10%

(c) 12.5%

(d) 15%

Ans : (b)

Exp : Let x be the original price of the item.

As per given condition,

New value of item $= x \times 1.25 \times 0.8 \times 1.10 = 1.10x$

i.e. resultant increase in the price is 10%,

Hence, option (b) is the correct answer.

Directions for the following 3 (three) items:

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

Passage

In some places in the world, the productivity of staples such as rice and wheat has reached a plateau. Neither new strains nor fancy agrochemicals are raising the yields. Nor is there much unfarmed land left that is suitable to be brought under the plough. If global temperature continues to rise, some places will become unsuitable for farming. Application of technology can help overcome these problems. Agricultural technology is changing fast. Much of this change is brought about by affluent farmers in the West/Americas. Techniques developed in the West are being adapted in some places to make tropical crops more productive. Technology is of little use if it is not adapted. In the developing world, that applies as much to existing farming techniques as it does to the latest advances in genetic modification. Extending to the smallholders and subsistence farmers of Africa and Asia the best of today's agricultural practices, in such simple matters as how much fertilizers to apply and when, would lead to a greatly increased availability of food for humanity. So would things like better roads and storage facilities, to allow for the carriage of surpluses to markets and reduce wastage.

21.   Based on the above passage, the following assumptions have been made :
1. Development of agricultural technology is confined to developed countries.
2. Agricultural technology is not adapted in developing countries.
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)

Exp : Statement 1 is too extreme assumption to be correct because no such argument is given in the passage. Statement 2 is not correct because the passage says it is being adapted in some places for tropical areas. Thus, option (d) is correct answer.

22.   Based on the above passage, the following assumptions have been made :
1. Poor countries need to bring about change in their existing farming techniques.
2. Developed countries have better infrastructure and they waste less food.
Which of the above assumption is/are valid?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans : (c)

Exp : Statement 1 is correct because the passage argues, "Technology is of little use if it is not adapted. In the developing world, that applies as much to existing farming techniques as it does to the latest advances in genetic modification." Statement 2 is correct assumption because the arguments given in last two lines are supported by this assumption. Thus, option (c) is correct answer.

23.   Based on the above passage, the following assumptions have been made :
1. Growing enough food for future generations will be a challenge.
2. Corporate farming is a viable option for food security in poor countries.
Which of the above assumption is/are valid?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Ans : (a)

Exp : Statement 1 is correct assumption because first four lines sufficiently highlight this assumption. Statement 2 is

incorrect because nowhere the passage talks about the corporate farming. Thus, option (a) is correct answer.

24. **The letters A, B, C, D and E are arranged in such a way that there are exactly two letters between A and E. How many such arrangements are possible?**
(a) 12
(b) 18
(c) 24
(d) 36

Ans : (c)

Exp : According to given condition. the relative position of letters A and E is fixed so, permutations possible for position of letter A and E is '2' .... (1)

___ A/E ___ ___ E/A ___

Now, for remaining 3 letters permutation posible for letters between A and E = 3 × 2 = 6 .... (2)
Now remaining 1 letter will be at end of the word or begining of the word, so permutation for that letter's position = 2 ...... (3)
Thus, total such arrangements possible are 2 × 6 × 2 = 24 .... [∵ from (1), (2), (3)]
Hence, option (c) is the correct answer.

25. **Consider the Question and two Statements given below :**
Question : Is Z brother of X?
Statement - 1 : X is a brother of Y and Y is a brother of Z.
Statement - 2 : X, Y and Z are siblings.
Which one of the following is correct in respect of the Question and the Statements?
(a) Statement - 1 alone is sufficient to answer the Question.
(b) Statement - 2 alone is sufficient to answer the Question.
(c) Both Statement-1 and Statement-2 are sufficient to answer the Question.
(d) Both Statement-1 and Statement-2 are not sufficient to answer the Question.

Ans : (d)

Exp : From statement 1, the gender of X and Y is confirmed i.e. they are male but the gender of Z is not confirmed. Thus statement 1 alone is not sufficient to answer the question.
From statement 2, the gender of x, y and z is not clear.
Hence, statement 2 alone is not sufficient to answer the question.
From both the statements 1 and 2, we do not have clarity about the gender of Z. Hence both statements 1 and 2 are not sufficient to answer the question.
Thus, option (d) is the correct answer.

26. **On one side of a 1.01 km long road, 101 plants are planted at equal distance from each other. What is the total distance between 5 consecutive plants?**
(a) 40 m
(b) 40.4 m
(c) 50 m
(d) 50.5 m

Ans : (b)

Exp : As given total length of the road is 1.01 km i.e. 1010 m
Total number of intervals between 101 plants = 100
Thus, distance between any two consecutive plants = $\dfrac{1010}{100}$

$$= 10.1 \text{ m}$$
∴ The total distance between 5 consecutive plants = 10.1 m × 4
$$= 40.4 \text{ m}$$
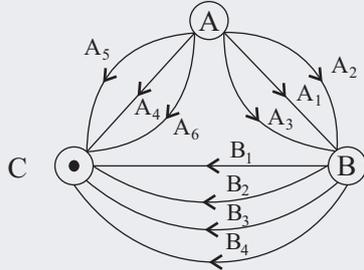Hence, option (b) is the correct answer.

27. **A, B and C are three places such that there are three different roads from A to B, four different roads from B to C and three different roads from A to C. In how many different ways can one travel from A to C using**

these roads?
(a) 10
(b) 13
(c) 15
(d) 36

Ans : (c)

Exp : As given,

Thus, from above figure we can say that,

Number of different ways can one travel from city A to city C

= (No. of direct ways from city A to city C) + (No. of ways from city A to via city B)

= 3 + (3 × 4)

= 15

Hence, option (c) is the correct answer.

28. **A has some coins. He gives half of the coins and 2 more to B. B gives half of the coins and 2 more to C. C gives half of the coins and 2 more to D. The number of coins D has now, is the smallest two digit number. How many coins does A have in the beginning?**

(a) 76
(b) 68
(c) 60
(d) 52

Ans : (d)

Exp : Let A has x number of coins.

Number of coins B has $= \dfrac{x}{2} + 2 = \dfrac{x + 4}{2}$

Number of coins C has $= \left[\left(\dfrac{x + 4}{2}\right) \times \dfrac{1}{2}\right] + 2 = \dfrac{x + 12}{4}$

Number of coins D has $= \left[\left(\dfrac{x + 12}{4}\right) \times \dfrac{1}{2}\right] + 2 = \dfrac{x + 28}{8}$

Now as given total number of coins D has is equal to 10

$\therefore \dfrac{x + 28}{8} = 10$

$\therefore x + 28 = 80$

$\therefore x = 52$

Hence, option (d) is the correct answer.

29. **In the series AABABCABCDABCDE....... which letter appears at the 100th place?**

(a) G
(b) H
(c) I
(d) J

Ans : (c)

Exp : The pattern given in the series is :

A AB ABC ABCD ABCDE
1   2   3   4   5

Thus E is at 15th position i.e. $\left(\frac{5 \times 6}{2}\right)$ th position i.e. sum of consecutive number tills and it is at 5th position in alphabet series.

Here we have to take sum of such consentive numbers which give the sum greater than 100 or less than 100.

Thus, sum of all numbers from 1 to 13 is

$$= \frac{13 \times 14}{2} \quad \ldots \ldots \left(\because \text{sum} = \frac{n \times (n+1)}{2}\right)$$

Thus at 91st position we will have 13th letter of alphabet from this position the next group will start from A again and 9th letter in that group will be 100th letter in the series. It is because

= 91 + 9 = 100

Thus 9th letter in alphabet is

A B C D E F G H I

Thus, option (c) is correct answer.

30. **Three persons A, B, and C are standing in a queue not necessarily in the same order. There are 4 persons between A and B, and 7 persons between B and C. If there are 11 persons ahead of C and 13 behind. A, what could be the minimum number of persons in the queue?**

    (a) 22
    (b) 28
    (c) 32
    (d) 38

Ans : (a)

Exp : The possible arrangement would be
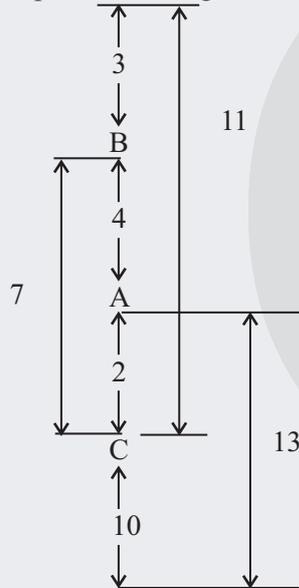
Thus answer = 10 + 1 (i.e. C) + 11 = 22

Thus, option (a) is correct answer.

Directions for the following 4 (four) items:

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

Passage - 1

Natural selection cannot anticipate future environments on the earth. Therefore, the set of existing organisms can never be fully prepared for environmental catastrophes that await life. An outcome of this is the extinction of those species which cannot overcome environmental adversity. This failure to survive, in modern terms, can be attributed to the genomes which are unable to withstand geological vagaries or biological mishaps (infections, diseases and so on). In biological evolution on the earth, extinction of species has been a major feature. The earth may presently have up to ten million species, yet more than 90% of species that have ever lived on the earth are now extinct. Once again, the creationist doctrines fail to satisfactorily address why a divine creator will firstly bother to create millions of species

and then allow them to perish. The Darwinian explanation for extinct life is once again simple, elegant and at once conveincing -organisms go extinct as a function of environmental or biological assaults for which their inheritance deems them ill-equipped. Therefore, the so-called Darwinian theory of evolution is not a theory at all. Evolution happens-this is a fact. The mechanism of evolution (Darwin proposed natural selection) is amply supported by scientific data. Indeed, to data no single zoological, botanical, geological, paleontological, genetic or physical evidence has refuted either of the central two main Darwinian ideas. If religion is not taken into consideration, Darwinian laws are acceptable just like the laws proposed by Copernicus, Galileo, Newtion and Einstein-sets of natural laws that explain natural phenomena in the universe.

31. **According to the passage, natural selection cannot anticipate future environments on the eath as**
    1. species not fully prepared to face the environmental changes that await them will face extinction.
    2. all the existing species would get extinct as their genomes will not withstand biological mishaps.
    3. inability of the genome to withstand environmental changes would result in extinction.
    4. extinction of species is a common feature.
    Select the correct answer using the code given below.
    (a) 1, 2 and 3
    (b) 2, 3 and 4
    (c) 1, 3 and 4
    (d) 1, 2 and 4

Ans : (c)

Exp : Statement 2 is not correct because it is a sweeping statement as it talks about 'all the existing species'. On the other hand the passage talks about 'extinction of those species that cannot overcome environmental adversity.' Thus, by elimination options (a), (b) and (d) are incorrect. Thus, option (c) has to be correct answer.

32. **The passage suggests that Darwinian theory of evolution is not a theory at all because.**
    (a) it does not satisfy the creationist doctrine.
    (b) extinction is a function of environment and biological assaults
    (c) there are no evidences to refute it.
    (d) existence of organisms is attributed to a creator.

Ans : (c)

Exp : Option (c) is correct answer because such a cause and effect relationship is directly supported by the last part of the passage. Other options do not have such a support.

33. **With reference to the passage, the following assumptions have been made :**
    1. Only species that have the ability to overcome environmental catastrophes will survive and perpetuate.
    2. More than 90% of the species on the earth are in the danger of getting extinct due to drastic changes in the environment.
    3. Darwin's theory explains all the natural phenomena.
    Which of the above assumptions is/are valid?
    (a) 1 only
    (b) 1 and 2 only
    (c) 3 only
    (d) 1, 2 and 3

Ans : (a)

Exp : Statement 2 is incorrect because the passage talks about 90 percent of the species gone extinct. Statement 3 is too extreme to be correct statement. Statement 1 is correct because it supports arguments given in the first part of the passage. Thus, option (a) is correct answer.

Passage - 2

With steady economic growth, higher literacy and increasing skill levels, the number of Indian middle-class families has gone up exponentially. Direct results of the affluence have been changes in dietary patterns and energy consumption levels. People have moved to a higher protein-based diet like milk products, fish and meat, all of which need significantly more water to produce than cereal-based diets. Increasing use of electronic and electric machines/gadgets and motor vehicles needs more and more energy and generation of energy needs water.

34. **Which one of the following statements best reflects the crux of the passage?**
    (a) People should be persuaded to continue with the mainly Indian traditional cereal-based diets.

(b) India needs to focus on developing agricultural productivity and capacity for more energy generation in the coming years.

(c) Modern technological developments result in the change of cultural and social behaviour of the people.

(d) Water management practices in India need to change dramatically in the coming years.

Ans : (d)

Exp : Towards the end of project the passage hints rising requirement of water due to change in diet and rising need of energy that need water. Thus, it hints towards better management of water to meet rising needs. Thus, option (d) is correct answer.

35. **How many seconds in total are there in x weeks, x days, x hours, x minutes and x seconds?**

(a) 11580x

(b) 11581x

(c) 694860x

(d) 694861x

Ans : (d)

Exp : The total number of seconds is

$= x$ sec. $+ x$ min. $+ x$ hours $+ x$ days $+ x$ weeks

Convective all of them into seconds.

$\therefore$ Answer $= x (60 \times x) + (60 \times 60 \times x) + (60 \times 60 \times 24 \times x) + (60 \times 60 \times 24 \times 7 \times x)$

$= x [1 + 60 + 3600 + 86,400 + 6,04,800]$

Since the figure is greater than 6 lacs and there is 1 at its units place, the right answer is 694861x

Thus, option (d) is correct answer.

36. **P, Q, R, S, T and U are six members of a family. R is the spouse of Q. U is the mother of T and S is the daughter of U. P's daughter is T and R's son is P. There are two couples in the family. Which one of the following is correct?**

(a) Q is the grandfather of T

(b) Q is the grandmother of T

(c) R is the mother of P

(d) T is the granddaughter of Q

Ans : (d)

Exp : Since nowhere gender of Q and R is clear.

Option (a), (b) and (c) cannot be right answer.

Thus, option (d) is correct answer.

37. **Consider the Question and two Statements given below in respect of three cities P, Q and R in a State :**

Question : How far is city P from city Q?

Statement - 1 : City Q is 18 km from city R.

Statement - 2 : City P is 43 km from city R.

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

(a) Statement -1 alone is sufficient to answer the Question.

(b) Statement -2 alone is sufficient to answer the Question.

(c) Both Statement-1 and Statement-2 are sufficient to answer the Question.

(d) Both Statement-1 and Statement-2 are not sufficient to answer the Question.

Ans : (d)

Exp : Since, it is not know that exactly in which direction cities P and Q all located from R, the distance between them cannot calculated.

Thus, both statements are not sufficient.

Thus, option (d) is correct answer.

38. **Two Statements followed by four conclustions are given below. You have to take the Statements to be true even if they seem to be at variance from the commonly known facts. Read all the commonly know facts. Read all the Conclusions and then decide which of the given Conclusions logically follows/follow from the Statements, disregarding the commonly know facts :**

Statement -1 : All pens are books.

Statement - 2 : No chair is a pen.

Conclusion - I : All chairs are books.

Conclusion - II : Some chairs are pens.
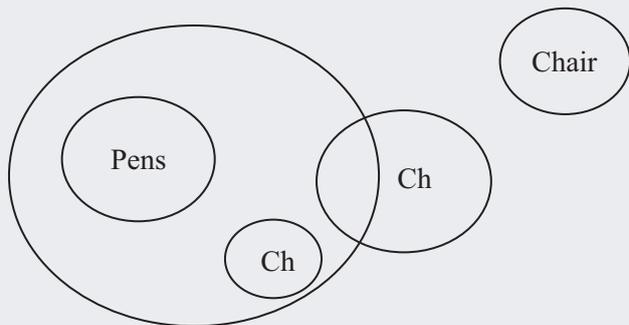
Conclusion - III : All books are chairs.

Conclusion - IV : No chair is a book.

Which one of the following is correct?

(a) Only Conclusion - I

(b) Only Conclusion - II

(c) Both Conclusion - III and Conclusion - IV

(d) None of the Conclusions follows.

Ans : (d)

Exp : From the given statements, diagram can be drawn as follow :

From the above diagram, conclusion 1, 2 and 4 are possibilities. Thus, they are not valid.

Conclusion 3rd is not visible.

Thus, option (d) is correct answer.

39. **Three Statements followed by three Conclusions are given below. You have to take the Statements to be true even if they seem to be at variance from the commonly known facts. Read all the Conclusions and then decide which of the given Conclusions logically follows/follow from the Statements, disregarding the commonly know facts :**

Statement -1 : Some doctors are teachers.

Statement - 2 : All teachers are engineers.

Statement - 3 : All engineers are scientists.

Conclusion - I : Some scientists are doctors.

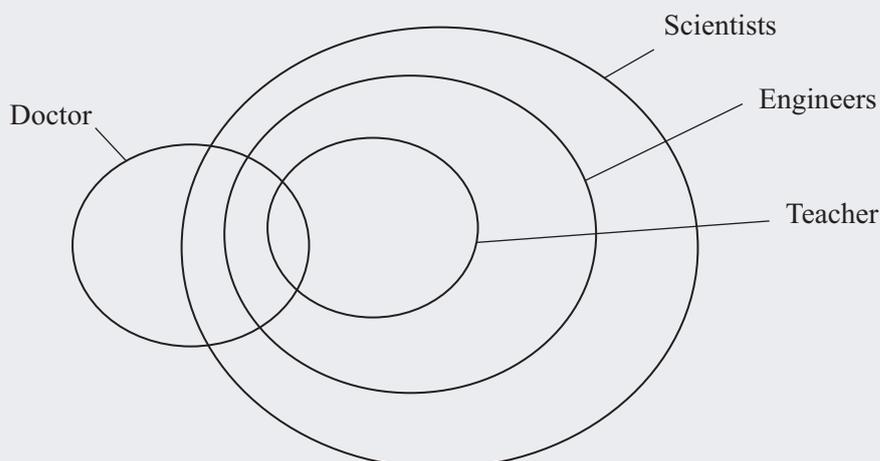Conclusion - II : All engineers are doctors.

Conclusion - III : Some engineers are doctors.

Which one of the following is correct?

(a) Only Conclusion - I

(b) Only Conclusion - II

(c) Both Conclusion - I and Conclusion - III

(d) Both Conclusion - I and Conclusion - II

Ans : (c)

Exp : Diagram can be drawn as follow :

From the above diagram only conclusion 1 and 3 are correct.

Thus, option (c) is correct answer.

40. **Eight students A, B, C, D, E, F, G and H sit around a circular table, equidistant from each other, facing the centre of the table, not necessarily in the same order. B and D sit neither adjacent to C nor opposite to C. A sits in between E and D, and F sits in between B and H. Which one of the following is definitely correct?**

(a) B sits in between A and G

(b) C sits opposite to G.

(c) E sits opposite to F

(d) None of the above

Ans : (b)

Exp :
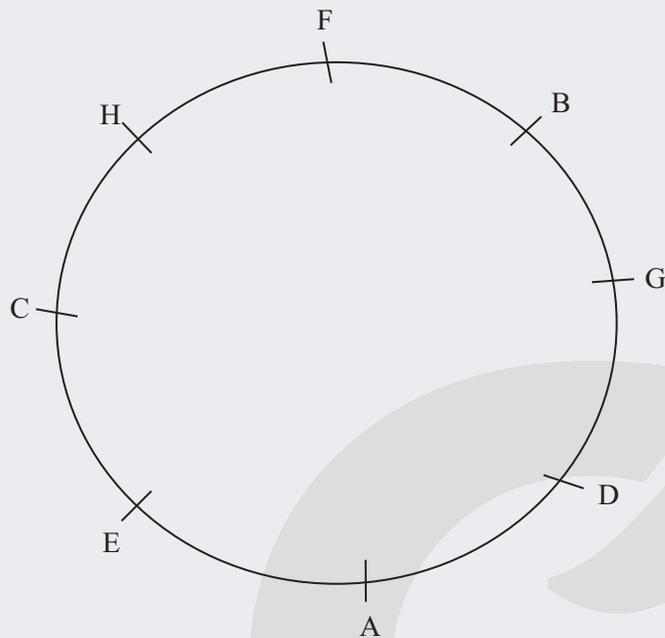
From the above diagram option (b) is correct answer.

Directions for the following 4 (four) items:

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

Passage - 1

For two or three generations past, everincreasing numbers of individuals have been living as workers merely, not as human beings. An excessive amount of labour is rule today in every circle of society, with the result that man's spiritual element cannot thrive. He finds it very difficult to spend his little leisure in serious activities. He does not want to think; or he cannot even if he wants to. He seeks not self-improvement, but entertainment which would enable him to be mentally idle and to forget his usual activities. Therefore, the so-called culture of our age is dependant more on cinema than on theatre, more on newspapers, magazines and crime stories than on serious literature.

41. **The passage is based on the idea that**

(a) man should not work hard

(b) the great evil of our age is overstrain

(c) man cannot think well

(d) man cannot care for his spiritual welfare.

Ans : (d)

Exp : Option (d) is correct answer because entire passage supports it. Other options do not have clear support in the passage. This question is about main idea.

42. **Man does not seek self-improvement because he**

(a) is not intellectually capable

(b) has no time to do so

(c) is distracted by materialism

(d) loves amusement and is mentally idle.

Ans : (d)

Exp : Option (a) and (c) does not have basis and thus they are incorrect. Option (b) is incorrect because such argument is not made in the passage. On the other hand the passage says, 'He seeks not self-improvement, but entertainment which would enable him to be mentally idle and to forget his usual activities.' Thus, option (d) is correct answer.

Passage - 2

The demographic dividend, which has begun in India and is expected to last another few decades, is a great window of opportunity. The demographic dividend is basically a swelling in the working age population, which conversely means that the relative ratio of very young and very old will, for a while, be on the decline. From the experience of Ireland and China, we know that this can be a source of energy and an engine of economic growth. The demographic dividened tends to raise a nation's savings rate since in any nation, it is the working age population that is the main saver. And since the savings rate is an important driver of growth, this should help elevate our growth rate. However, the benefits of demographic dividend depend on the quality of the working age population. And this implies bringing back the importance of eduction, acquisition of skills and human capital.

43. Which of the following would invariably happen in a country, when the demographic divided has begun to operate?
1. The number of illiterate people will decrease.
2. The ratio of very old and very young will decrease for a while.
3. Population growth rate will quickly stabilize.
Select the correct answer using the code given below.
(a) 1 and 2 only
(b) 2 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans : (b)

Exp : Statement 1 is incorrect because last line says education is important to improve quality of human capital. Thus, by elimination options (a), (c) and (d) are incorrect. Thus, option (b) is correct option.

44. With reference to the passage, which of the following inferences can be drawn?
1. Demographic dividend is an essential condition for a country to rapidly increase its economic growth rate.
2. Promotion of higher eduction is an essential condition for a country for its rapid economic growth.
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 : (d)

Exp : Both the statements have become wrong due to use of the word 'essential'. Such extreme argument is not made in the passage. Thus, option (d) is correct answer.

45. Five friends P, Q, X, Y and Z purchased some notebooks. The relevant information is given below :
1. Z purchased 8 notebooks more than X did.
2. P and Q together purchased 21 notebooks.
3. Q purchased 5 notebooks less than P did.
4. X and Y together purchased 28 notebooks.
5. P purchased 5 notebooks more than X did.
If each notebook is priced ₹ 40, then what is the total cost of all the notebooks?
(a) ₹ 2,600
(b) ₹ 2,400
(c) ₹ 2,360
(d) ₹ 2,320

Ans : (a)

Exp : According to given information

Z – X = 8 ....(1)

P + Q = 21 .... (2)

P – Q = 5 .... (3)

X + Y = 28 .... (4)

P – X = 5 .... (5)

By solving (2) and (3) we get

2P = 21 + 5 = 26

∴ P = 13

∴ Q = 21 – 13 = 8 [∵ (2)]

By keeping P in (5)

13 – X = 5

∴ X = 8

By putting X in (1) we get

∴ Z = 16

By putting X in (4) we get

Y = 20

Total cost = 40 × (P + Q + X + Y + Z)

   = 40 × (21 + 28 + 16)

   = 40 × 65 = 2600

Thus, option (a) is the answer.

46.   **A man started from home at 14 : 30 hours and drove to village, arriving there when the village clock indicated 15 : 15 hours. After staying for 25 minutes, he drove back by a different route of length 1.25 times the first route at a rate twice as fast reaching home at 16:00 hours. As compared to the clock at home, the village clock is**
       (a) 10 minutes slow
       (b) 5 minutes slow
       (c) 10 minutes fast
       (d) 5 minutes fast

Ans : (d)

Exp : Let x be the distance from home to village.

Total distance travelled = x + 1.25x

Total time taken = 90 - 25 = 65 min.

Let time taken in first trip as 't'

Speed while going to village = $\dfrac{x}{t}$

Speed while coming back = $\dfrac{2x}{t}$

Time taken while coming back = $\dfrac{1.25x}{2\,x/t} = \dfrac{1.25}{2}t$

Total time = 65 min = $t + \dfrac{1.25}{2}t$

$65 = \dfrac{3.25}{2}t$

∴ t = 40 minute

Thus, actual time that should be show after 14 : 30 hour is 15 : 10. But village clock shows 15 : 15 hours. Thus, it is 5 minutes fast.

47.   **A person X wants to distribute some pens among six children A, B, C, D, E and F. Suppose A gets twice the number of pens received by B, three times that of C, four times that of D, five times that of E and six times**

that of F. What is the minimum number of pens X should buy so that the number of pens each one gets is an even number?

(a) 147

(b) 150

(c) 294

(d) 300

Ans : (c)

Exp : Let A, B, C, D, E and F are the number of Pens got by A, B, C, D, E and F respectively.

$\therefore$ A = 2B = 3C = 4D = 5E = 6F

To get minimum number of pens first calculate LCM of 2, 3, 4, 5 and 6

the number is divisible by

So that A, B, C, D, E and F

LCM of 2, 3, 4, 5 and 6 = 60

$\therefore$ A = 60 then B = 30, C = 20, D = 15

The value of D violates the condition.

$\therefore$ Take A = 120

$\therefore$ B = 60, C = 40, D = 30, E = 24, F = 20

$\therefore$ Total no. of pen = A + B + C + D + E + F

= 120 + 60 + 40 + 30 + 24 + 20 = 294

Thus, option (c) is correct answer.

48. **Six persons A, B, C, D, E and F are sitting equidistant from each other around a circular table (facing the centre of table)**

Consider the Question and two Statements given below :

Question : Who is sitting on the immediate left of A?

Statement - 1 : B is sitting opposite to C and D is sitting opposite to E.

Statement - 2 : F is sitting on the immediate left of B.

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

(a) Statement - 1 alone is sufficient to answer the Question.

(b) Statement - 2 alone is sufficient to answer the Question.

(c) Both Statement -1 and Statement - 2 are sufficient to answer the Question.

(d) Both Statement -1 and Statement - 2 are not sufficient to answer the Question.
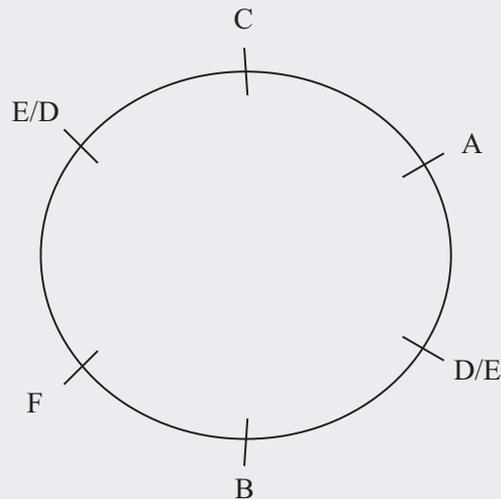
Ans : (c)

Exp : According to statement 1
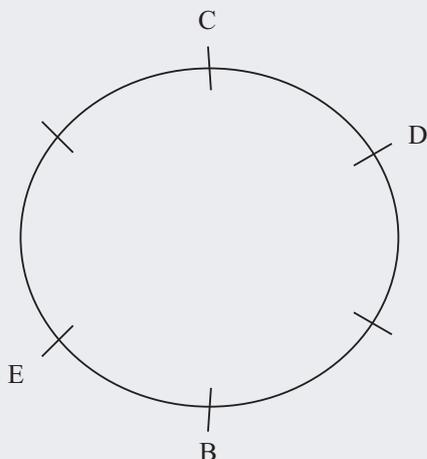
Thus, above diagram doesn't give exact answer.

Intuitively we can say statement 2 alone does not give exact answer.

Now, draw diagram by using both the statement

In above diagram, either D or E could be to the immediate to the left of A.

Thus, both statements are not enough to answer the question. Thus, option (d) is correct answer.

49. **Consider the Question and two Statements given below :**

Question : What is the age of Manisha?

Statement - 1 : Manisha is 24 years younger than her mother.

Statement - 2 : 5 years later, the ages of Manisha and her mother will be in the ratio 3 : 5

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

(a) Statement -1 alone is sufficient to answer the Question.

(b) Statement -2 alone is sufficient to answer the Question.

(c) Both Statement -1 and Statement - 2 are sufficient to answer the Question.

(d) Both Statement -1 and Statement - 2 are not sufficient to answer the Question.

Ans : (c)

Exp : Let x and y be the ages of manisha and her mother

According to statement 1

$y - x = 24$

According to statement 2

$$\frac{x + 5}{y + 5} = \frac{3}{5}$$

Thus, none of the above statements alone given the volume of x. But both together can give it.

Thus, option (c) is correct answer.

50. **Six lectures A, B, C, D, E and F, each of one hour duration are scheduled between 8 : 00 a.m. and 2 : 00 p.m.**

Consider the Question and two Statements given below :

Question : Which lecture is in the third period?

Statement - 1 : Lecture F is preceded by A and followed by C.

Statement - 2 : There is no lecture after lecture B.

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

(a) Statement - 1 alone is sufficient to answer the Question.

(b) Statement - 2 alone is sufficient to answer the Question.

(c) Both Statement -1 and Statement - 2 are sufficient to answer the Question.

(d) Both Statement -1 and Statement - 2 are not sufficient to answer the Question.

Ans : (d)

Exp : According to statement 1, the sequence is

A

F

C

According to statement 2, the last lecture is B at 1 p.m.

Thus, none of the above statements alone does not give answer

By combine both statement.

8	A		
9	F	A	
10	C	F	A
11		C	F
12			C
1	−E	E	E

Here, we, do not get exact answer.

Thus, option (d) is correct answer.

Directions for the following 3 (three) items:

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

Passage - 1

In an economic organization, allowing mankind to benefit by the productivity of machines should lead to a very good life of leisure, and much leisure is apt to be tedious except to those who have intelligent activities and interests. If a leisured population is to be happy, it must be an eductated population, and must be educated with a view to enjoyment as well as to the direct usefulness of technical knowledge.

51.   Which of the following statements best reflects the underlying tone of the passage?
    (a) Only an educated population can best make use of the benefits of economic progress.
    (b) All economic development should be aimed at the creation of leisure.
    (c) An increase in the educated population of a country leads to an increase in the happiness of its people.
    (d) Use of machines should be encouraged in order to create a large leisured population.

Ans : (a)

Exp : Option (b) is incorrect because the passage does not talk about aim of all economic development but rather of how mankind benefit by the productivity of machines and what is the role of education in it. Option (c) has no basis because increase in education and increase in happiness are not necessarily related unless leisured population is educated. Option (d) is incorrect because the emphasis is not on increase in use of machine but educating leisured population so that it can be happy. Thus, option (a) is correct because last line supports it.

Passage - 2

If presents bring less thrill now that we are grown up, perhaps it is because we have too much already; or perhaps it is because we have lost the fullness of the joy of giving, and with it the fullness of the joy of receiving. Children's fears are poignant, their miseries are acute, but they do not look too forward nor too far backward. Their joys are clear and complete, because they have not yet learnt always to add 'but' to every proposition. Perhaps we are too cautious, too anxious, too sceptical. Perhaps some of our cares would shrink if we thought less about them and entered with more single-minded enjoyment into the happiness that come our way.

52.   With reference to the passage, which one of the following statements is correct?
    (a) It is not possible for adults to feel thrilled by presents.
    (b) There can be more than one reason why adults feel less thrilled by presents.
    (c) The author does not know why adults feel less thrilled by presents.
    (d) Adults have less capacity to feel the joy of loving or being loved.

Ans : (b)

Exp : Option (a) is too extreme to be correct. Option (d) is incorrect because the option does not talk about capacity or less capacity of adult. Rather last line hints towards capacity for single minded enjoyment. Option (c) is not correct because the author talks about various reasons for the situation of adult in which they find themselves. Thus, option (b) is correct answer.

53.   The author of the passage is against.
   (a) worrying too much about the past and future.
   (b) being in the habit of thinking about presents
   (c) not being thrilled by new things.
   (d) giving and receiving joy only partially

Ans : (a)

Exp : Options (b), (c) and (d) are incorrect because they are supported by the arguments of the author who exhorts us to think less about 'what was' and 'what will be'. Thus, option (a) is correct answer.

54.   Let A, B and C represent distinct non-zero digits. Suppose x is the sum of all possible 3-digit numbers formed by A, B and C without repetition.
   Consider the following statements :
   1. The 4-digit least value of x is 1332
   2. The 3-digit greatest value of x is 888.
   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 : (a)

Exp : To have least value 3 - digit numbers we have to take 1, 2 and 3 as digits

   Thus, 4 - digit least number.

   123 + 132 + 213 + 231 + 312 + 321 = 1332

   Thus, statement 1 is correct.

   Now, 3 - digit greatest number we can get is 987

   Which is greater than 888.

   Thus, statement 2 is incorrect

   Thus, option (a) is correct answer.

55.   There is a numeric lock which has a 3-digit PIN. The PIN contains digits 1 to 7. There is no repetition of digits. The digits in the PIN from left to right are in decreasing order. Any two digits in the PIN differ by at least 2. How many maximum attempts does one need to find out the PIN with certainty?
   (a) 6
   (b) 8
   (c) 10
   (d) 12

Ans : (c)

Exp : The possible combinations of 3 - digit pin are

   753   742   731   642   631   531

   752   741   641

   751

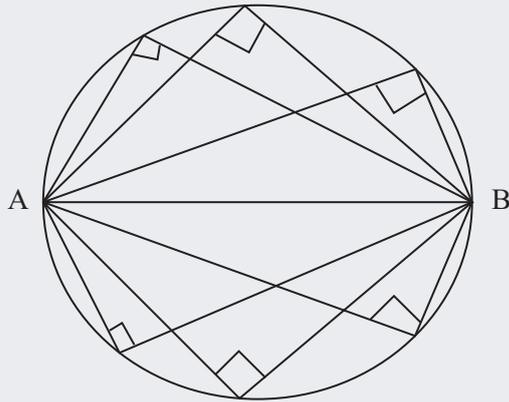   Thus, there are 10 possible pins. Thus, 10 attempts are needed.

   Thus, option (c) is correct answer.

56.   There are eight equidistant points on a circle. How many right-angled triangles can be drawn using these points as vertices and taking the diameter as one side of the triangle?
   (a) 24
   (b) 16
   (c) 12
   (d) 8

Ans : (a)

Exp : One arrangement in a diagram would look like :

Now for one side AB as diameter, there are 6 right-angled triangles. Now 4 lines like AB can be token as diameters.

Thus, total number of right-angled triangles = 4 × 6 = 24

Thus, option (a) is correct answer.

57. **24 men and 12 women can do a piece of work in 30 days. In how many days can 12 men and 24, women do the same piece of work?**

(a) 30 days

(b) More than 30 days

(c) Less than 30 days or more than 30 days

(d) Data is inadequate to draw any conclusion.

Ans : (d)

Exp : In this example the work rate of men and that of women are not known.

Thus, data is inadequate to find out the answer.

Thus, option (d) is correct answer.

58. **What is the remainder when**

91 × 92 × 93 × 94 × 95 × 96 × 97 × 98 × 99 is divided by 1261?

(a) 3

(b) 2

(c) 1

(d) 0

Ans : (d)

Exp : In this type of example we have to check whether the divisor is a prime number or what are its prime factors.

Thus, 1261 is divisible by 13.

1261 = 13 × 97

Now in a given product 97 is given and 91 = 13 × 7

Thus, when we divide the product by 1261 we get 0 as remainder.

Thus, option (d) is correct answer.

59. **Consider the following statements in respect of a rectangular sheet of length 20 cm and breadth 8 cm :**

1. It is possible to cut the sheet exactly into 4 square sheets.

2. It is possible to cut the sheet into 10 triangular sheets of equal area.

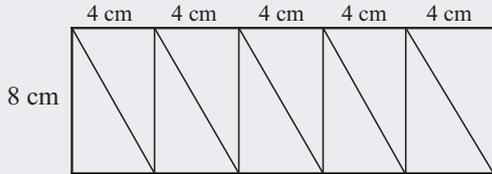Which of the above statements is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans : (c)

Exp : The rectangular sheet of 20cm × 8 cm can be exactly let into 4 square sheets consisting of 2 square sheets of 8cm × 8cm and 2 squares of 4cm × 4cm as follows :
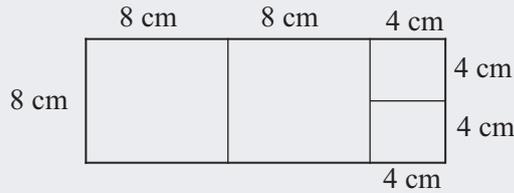
This rectangular sheet can also be cut into 10 triangular sheets of equal area as.

Thus, both the statements are correct.

Thus, option (c) is correct answer.

60. **When 70% of a number x is added to another number y, the sum becomes 165% of the value of z. Which one of the following is correct?**

(a) z < x < y

(b) x < y < z

(c) y < x < z

(d) z < y < x

Ans : (a)

Exp : According to 1st statement

$0.7x + y = 1.65y$

$\therefore 0.7x = 0.65y$

$\therefore \dfrac{x}{y} = \dfrac{0.65}{0.7}$

$x < y$ .... (1)

According to 2nd statement

$0.6x + z = 1.65z$

$0.6x = 0.65z$

$\therefore \dfrac{x}{z} = \dfrac{0.65}{0.6}$

$\therefore x > z$ .... (2)

from (1) and (2) we can write

z < x < y

Thus, optional (a) is correct answer.

Directions for the following 3 (three) items:

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

Passage - 1

The majority of people who fail to accumulate money sufficient for their needs, are generally, easily influenced by the opinions of others. They permit the newspapers and the gossiping neighbours to do their thinking for them. Opinions are the cheapest commodities on the earth. Everyone has a flock of opinions ready to be wished upon by anyone who will accept them. If you are influenced by opinions when you reach decisions, you will not succeed in any undertaking.

61. **Which one of the following is implied by the passage?**

(a) Most of the people do not accumulate money for their needs.

(b) Most of the people never fail to accumulate money for their needs.

(c) There are people who fail to accumulate money for their needs.

(d) There is no need to accumulate money.

Ans : (c)

Exp : Option (a), (b) and (d) do not have basis. Thus, they are incorrect. Option (c) is correct because it is implied in the very first line of the passage. Thus, option (c) is correct answer.

62. **What is the main idea of the passage?**
(a) People should not be influenced by the opinions of others.
(b) People should accumulate as much money as they can.
(c) People should neither give nor accept the opinions.
(d) People will succeed in any undertaking if they do not accept any opinion at all.

Ans : (a)

Exp : Option (b) is incorrect because no such argument is made in the passage. Option (c) and (d) are incorrect because they are too extreme. Option (a) is correct answer because it is hinted towards the end of the passage.

Passage - 2

"The social order is a sacred right which is the basis of all other rights. Nevertheless, this right does not come from nature, and must therefore be founded on conventions."

63. **With reference to the above passage, which of the following statements is/are correct?**
1. Conventions are the sources of rights of man.
2. Rights of man can be exercised only when there is asocial order.
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)

Exp : Both the statements are correct because the passage talks about making conventions the basis of our rights and social order as the basis of all our rights. Thus, option (c) is correct answer.

64. **Two candidates X and Y contested an election. 80% of voters cast their vote and there were no invalid votes. There was no NOTA (None of the above) option. X got 56% of the votes cast and won by 1440 votes. What is the total number of voters in the voters list?**
(a) 15000
(b) 12000
(c) 9600
(d) 5000

Ans : (a)

Exp : Let T be the total number of voters

∴ Numbers of votes cast = 0.8 T

∴ Difference between votes of X and that of Y

= (0.56 – 0.44) 0.8 T (∵ Y got remaining 44% of votes cast)

= 0.12 × 0.8 × T = 1440

$\therefore \dfrac{12}{100} \times \dfrac{8}{10} \times T = 1440 = 12 \times 12 \times 10$

∴ T = 3 × 5 × 100 × 10 = 15000

Thus, option (a) is correct answer.

65. **What is the smallest number greater than 1000 that when divided by any one of the numbers 6, 9, 12, 15, 18 leaves a remainder of 3 ?**
(a) 1063
(b) 1073
(c) 1083
(d) 1183

Ans : (c)

Exp : First calculate LCM of 6, 9, 12, 15, 18

3	6	9	12	15	18
3	2	3	4	5	6
2	2	1	4	5	2
2	1	1	2	5	1
5	1	1	1	5	1
	1	1	1	1	1

LCM = $2 \times 2 \times 3 \times 3 \times 5 = 180$

Thus, smallest 4 - digit number divisible by 180 is

$= 180 \times 6 = 1080$

The required number is $= 1080 + 3 = 1083$

Thus, option (c) is correct answer.

66. **Let p be a two-digit number and q be the number consisting of same digits written in reverse order. If p × q = 2430, then what is the difference between p and q?**

(a) 45

(b) 27

(c) 18

(d) 9

Ans : (d)

Exp : There is '0' at unit's place in 2430.

The digits when multiply each other give '0' at units place

are : 2 and 5 or 4 × 5 or 8 × 5

$25 \times 52 < 2430$

$45 \times 54 = 2430$

Thus, answer $= 54 - 45 = 9$

Thus, option (d) is correct answer.

67. **Consider the following statements in respect of two natural numbers p and q such that p is a prime number and q is a composite number :**

1. $p \times q$ can be an odd number.

2. q/p can be a prime number.

3. $p + q$ can be a prime number.

Which of the above statements are correct?

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

Ans : (d)

Exp : For first statement p = 3, q = 9

$$p \times q = 3 \times 9 = 27 \text{ .... (1)}$$

For 2nd statement also

$$q/p = 9/3 = 3 \text{ .... (2)}$$

For 3 rd statement p = 3, q = 8

$\therefore p + q = 3 + 8 = 11$ .... (3)

Thus, all statements are correct.

Thus, option (d) is correct answer.

68. Consider the following statements :
   1. Between 3 : 16 p.m. and 3 : 17 p.m., both hour hand and minute hand coincide.
   2. Between 4 : 58 p.m. and 4 :59 p.m., both minute hand and second hand coincide.
   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 : (a)

Exp : At 3 p.m. hour hand and minute hand are 15 min apart. To coincide minute hand has to cover 15 min more than hour hand. Thus, time required to do it is :

$$\frac{60}{55} = \frac{T}{15}$$

$$\therefore T = \frac{60 \times 15}{55} = \frac{180}{11} = 16.36$$

Thus, statement 1 is correct.

At 5 p.m. both hands are 25 min apart. Thus it is not possible to coincide between 4 : 58 p.m. and 4 : 59 p.m.

Thus, statement 2 is incorrect.

Thus, option (a) is correct answer.

69. There are two containers X and Y. X contains 100 ml of milk and Y contains 100 ml of water. 20 ml of milk from X is transferred to Y. After mixing well, 20 ml of the mixture in Y is transferred back to X. If m denotes the proportion of milk in X and n denotes the proportion of water in Y, then which one of the following is correct?
   (a) m = n
   (b) m > n
   (c) m < n
   (d) Cannot be determined due to insufficient data.

Ans : (a)

Exp : After transferring 20 ml of milk from X to Y the mixture in y consists of 20ml of milk and 100ml of water. Thus, their ratio becomes 1 : 5. When 20 ml of mixture is transferred from Y to X it also contains milk to water in the ratio 1 : 5

Thus milk = $\frac{1}{6} \times 20 = \frac{10}{3}$ ml

water = $\frac{5}{6} \times 20 = \frac{50}{3}$ ml

Thus, milk in X = $80 + \frac{10}{3} = \frac{250}{3}$

Similarly, water in Y = $100 - \frac{50}{3} = \frac{250}{3}$ ml

Thus, milk in X = $\frac{250}{3}$ = water in Y

Thus, option (a) is correct answer.

70. A pie chart gives the expenditure on five different items. A, B, C, D and E in a household. If B, C, D and E correspond to 90⁰, 50⁰, 45⁰ and 75⁰ respectively, then what is the percentage of expenditure on item A?
   (a) 112/9
   (b) 125/6
   (c) 155/9
   (d) 250/9

Ans : (d)

Exp : The expenditure on A in terms of degree of angle is :

$= 360^0 - (B + C + D + E)$

$= 360^0 - (90^0 + 50^0 + 45^0 + 75^0)$

$= 360^0 - 260^0 = 100^0$

Thus, percentage of expenditure on item A :

$$\frac{100^0}{360^0} \times 100 = \frac{1000}{36} = \frac{250}{9}$$

Thus, option (d) is correct answer.

Directions for the following 3 (three) items:

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

Passage - 1

To encourage research is one of the functions of a university. Contemporary universities have encouraged research, not only in those cases where research is necessary, but on all sorts of entirely unprofitable subjects as well. Scientific research is probably never completely valueless. However silly and insignificant it may seem, however mechanical and unintelligent the labours of the researchers, there is always a chance that the results may be of value to the investigator of talent, who can use the facts collected for him by uninspired but industrious researchers as the basis of some fruitful generalization. But where research is not original, but consists in the mere rearrangment of existing materials, where its objects is not scientific but literary or historical, then there is a risk of the whole business becoming merely futile.

71.   The author's assumption about scientific research is that
(a) it is never very valuable
(b) it is sometimes very valuable
(c) it is never without some value
(d) it is always very valuable

Ans : (c)

Exp : Since the question is specifically about scientific research, third and fourth statement of the passage support option (c). Thus, option (c) is correct answer. Option (a), (b) and (d) can be eliminated due to word 'very'.

72.   According to the author
(a) not many research results can be of value to an intelligent investigator
(b) a research result is always valuable to an intelligent investigator.
(c) any research result can be of value to an intelligent investigator
(d) a research result must always be of some value to an intelligent investigator

Ans : (c)

Exp : Option (c) is correct answer because the passage makes use word 'may'. And option makes use of word 'can.' Other options appear extreme. Thus, they are incorrect.

Passage - 2

How best can the problems of floods and droughts be addressed so that the losses are minimal and the system becomes resilient? In this context, one important point that needs to be noted is that India gets 'too much' water (about 75% of annual precipitation) during 120 days (June to September) and 'too little' for the remaining 245 days. This skewed water availability has to be managed and regulated for its consumption throughout the year.

73.   Which one of the following best reflects the practical, rational and lasting solution?
(a) Constructing huge concrete storage tanks and canals across the country
(b) Changing the cropping patterns and farming practices
(c) Interlinking of rivers across the country
(d) Buffer stocking of water though dams and recharging aquifers

Ans : (d)

Exp : Option (a) is incorrect because in what way canals would help is not clear. Moreover, huge concrete storage tanks does not appear practical. Options (b) and (c) are incorrect because they are not the focus of the passage. Option (d) is correct because that appears to be more rational solution in terms of storing excess water got during 120 days.

74.　**If $15 \times 14 \times 13 \times ..... \times 3 \times 2 \times 1 = 3^m \times n$**

Where m and n are positive integers, then what is the maximum value of m?

(a) 7

(b) 6

(c) 5

(d) 4

Ans : (b)

Exp : There are 5 multiples of 3 upto 15.

They are : $3 \times 1, 3 \times 2, 3 \times 3, 3 \times 4, 3 \times 5$

Thus,

$\therefore 3^m = 3^6$　　$(\because 3 \times 3 = 9)$

$\therefore m = 6$

Thus, option (b) is correct answer.

75.　**What is the value of X in the sequence 2, 12, 36, 80, 150, X?**

(a) 248

(b) 252

(c) 258

(d) 262

Ans : (b)

Exp : We can find out the pattern by taking difference between adjacent numbers as they are in an increasing order.

2　　12　　36　　80　　150　　X = 150 + 102 = 22

　　10　　24　　44　　70　　102　(70 + 32)

　　　14　　20　　26　　32　(26 + 6)

　　　　6　　6　　6
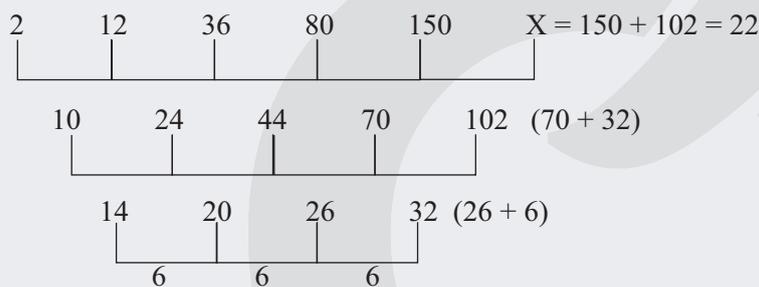
X = 252

Thus, option (b) is correct answer.

76.　**One non-zero digit, one vowel and one consonant from English alphabet (in capital) are to be used in forming passwords, such that each password has to start with a vowel and end with a consonant. How many such passwords can be generated?**

(a) 105

(b) 525

(c) 945

(d) 1050

Ans : (c)

Exp : There are 5 vowels, 9 digits and 21 consonant

Thus, the number of passwords with their combinations :

$= 5 \times 9 \times 21 = 945$

Thus, option (c) is correct answer.

77.　**There are 9 cups placed on a table arranged in equal number of rows and columns out of which 6 cups contain coffee and 3 cups contain tea. In how many ways can they be arranged so that each row should contain at least one cup of coffee?**

(a) 18

(b) 27

(c) 54

(d) 81

Ans : (d)

Exp : In this examples 9 cups are arranged in 3 rows and 3 columns

Now 6 cups of coffee with at least 1 cup in each vow can have following possibilities.

Possibility 1

| 1 cup | C T T | → | Permutation = $3P_1$ = 3 |

| 2 cups | C T T | → | Permutation = $\dfrac{3P_2}{2!}$ = 3 |

| 3 cups | C C C | → | Permutation = $3P_3$ = 1 |

Now such combinations are → 3 × 2 × 1 = 6

Total arrangements of this possibility = 6 × 3 × 3 × 1 = 54

Now Possibility 2

| 2 cup | C C T | → | Permutation = $\dfrac{3P_2}{2!}$ = 3 |

| 2 cups | C C T | → | Permutation = 3 |

| 2 cups | C C T | → | Permutation = 3 |

Now such combinations is only 1

Thus, total arrangements of this possibility = 3 × 3 × 3 = 27

∴ Number of possible arrangements = 54 + 27 = 81

Thus, option (d) is correct answer.

78. **The sum of three consecutive integers is equal to their product. How many such possibilities are there?**

(a) Only one

(b) Only two

(c) Only three

(d) No such possibility is there

Ans : (b)

Exp : Let x be the smallest integer.

Thus, there integers are x, x + 1, x + 2

Thus, according to given conditions

$x \times (x + 1) \times (x + 2) = x + x + 1 + x + 2$

$x (x + 1) (x + 2) = 3x + 3 = 3 (x + 1)$

$x (x + 2) = 3$

$x^2 + 2x - 3 = 0$

$x + 3x - x - 3 = 0$

$x (x + 3) - 1 (x + 3) = 0$

$(x - 1) (x + 3) = 0$

$x = 1$ or $x = -3$

Thus, there are two possibilities

First 1, 2, 3

Second −3, −2, −1

Thus, option (b) is correct answer.

79. **What is the number of numbers of the form 0.XY, where X and Y are distinct non-zero digits?**

(a) 72

(b) 81

(c) 90

(d) 100

Ans : (a)

Exp : At the place of X any digit between 1 and 9 can come. And any digit of the remaining 8 digits can come at Y.

Thus, the number of such numbers

$= 9 \times 8 = 72$

Thus, option (a) is correct answer.

80. **The average weight of A, B, C, is 40 kg., the average weight of B, D, E is 42 kg and the weight of F is equal to that of B. What is the average weight of A, B, C, D, E and F?**
    (a) 40.5 kg
    (b) 40.8 kg
    (c) 41 kg
    (d) Cannot be determined as data is inadequate

Ans : (c)

Exp : According to given data

$\dfrac{A + B + C}{3} = 40$

$\therefore A + B + C = 120$ .... (1)

Similarly,

$\dfrac{B + D + E}{3} = 42$

$\therefore B + D + E = 126$ .... (2)

Adding (1) and (2)

$A + B + C + B + D + E = 246$

Here, $B = F$

$\therefore A + B + C + F + D + E = 246$

$\therefore$ Average $= \dfrac{A + B + C + F + D + E}{6} = \dfrac{246}{6} = 41$

Thus, option (c) is correct answer.

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1	a	a	c	d	a	a	d	d	b	c
11	c	d	a	a	b	d	c	b	d	b
21	d	c	a	c	d	b	c	d	c	a
31	c	c	a	d	d	d	d	d	c	b
41	d	d	b	d	a	d	c	c	c	d
51	a	b	a	a	c	a	d	d	c	a
61	c	a	c	a	c	d	d	a	a	d
71	c	c	d	b	b	c	d	b	a	c

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11	d	c	a	c	d	b	c	d	c	a
21	c	d	a	a	b	d	c	b	d	b
31	a	a	c	d	a	a	d	d	b	c
41	c	c	d	b	b	c	d	b	a	c
51	c	a	c	a	c	d	d	a	a	d
61	a	b	a	a	c	a	d	d	c	a
71	d	d	b	d	a	d	c	c	c	d

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11	a	a	c	d	a	a	d	d	b	c
21	c	c	a	d	d	d	d	d	c	b
31	c	d	a	a	b	d	c	b	d	b
41	c	a	c	a	c	d	d	a	a	d
51	d	d	b	d	a	d	c	c	c	d
61	c	c	d	b	b	c	d	b	a	c
71	a	b	a	a	c	a	d	d	c	a

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	1	2	3	4	5	6	7	8	9	10
1	c	d	a	a	b	d	c	b	d	b
11	c	c	a	d	d	d	d	d	c	b
21	a	a	c	d	a	a	d	d	b	c
31	d	c	a	c	d	b	c	d	c	a
41	a	b	a	a	c	a	d	d	c	a
51	c	c	d	b	b	c	d	b	a	c
61	d	d	b	d	a	d	c	c	c	d
71	c	a	c	a	c	d	d	a	a	d