



**FORTUNE  
IAS ACADEMY**

**PTS 2025  
COMPREHENSIVE  
TEST 01 - PAPER II KEY**

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## Comprehensive Test 01 - PAPER-II

1	<b>c</b>	21	<b>a</b>	41	<b>d</b>	61	<b>a</b>
2	<b>b</b>	22	<b>a</b>	42	<b>a</b>	62	<b>a</b>
3	<b>d</b>	23	<b>c</b>	43	<b>b</b>	63	<b>b</b>
4	<b>d</b>	24	<b>a</b>	44	<b>a</b>	64	<b>a</b>
5	<b>c</b>	25	<b>d</b>	45	<b>c</b>	65	<b>b</b>
6	<b>c</b>	26	<b>d</b>	46	<b>b</b>	66	<b>a</b>
7	<b>b</b>	27	<b>d</b>	47	<b>c</b>	67	<b>c</b>
8	<b>d</b>	28	<b>c</b>	48	<b>a</b>	68	<b>b</b>
9	<b>a</b>	29	<b>d</b>	49	<b>d</b>	69	<b>a</b>
10	<b>c</b>	30	<b>b</b>	50	<b>b</b>	70	<b>c</b>
11	<b>d</b>	31	<b>b</b>	51	<b>c</b>	71	<b>c</b>
12	<b>c</b>	32	<b>a</b>	52	<b>a</b>	72	<b>a</b>
13	<b>d</b>	33	<b>a</b>	53	<b>b</b>	73	<b>c</b>
14	<b>c</b>	34	<b>b</b>	54	<b>c</b>	74	<b>a</b>
15	<b>b</b>	35	<b>d</b>	55	<b>d</b>	75	<b>d</b>
16	<b>a</b>	36	<b>c</b>	56	<b>c</b>	76	<b>b</b>
17	<b>c</b>	37	<b>b</b>	57	<b>b</b>	77	<b>b</b>
18	<b>a</b>	38	<b>c</b>	58	<b>b</b>	78	<b>d</b>
19	<b>b</b>	39	<b>c</b>	59	<b>c</b>	79	<b>c</b>
20	<b>c</b>	40	<b>c</b>	60	<b>a</b>	80	<b>b</b>



1) **Answer: (c)**

**Difficulty Level: Easy**

- **Assumption 1 is INCORRECT:** The passage highlights that global warming will lead to both droughts and extreme weather events like floods, hurricanes, and storms, making it a multifaceted threat.
- **Assumption 2 is CORRECT:** Although not directly stated, the passage implies that the impacts of global warming—such as floods, droughts, and rising sea levels—will disproportionately affect areas with high population density, exacerbating socio-economic challenges.
- **Assumption 3 is CORRECT:** The passage mentions the adverse effects of recurring droughts and floods on arable land and the dependence of farmers on major rivers, highlighting agriculture's reliance on predictable environmental factors.

2) **Answer: (b)**

**Difficulty Level: Easy**

- **Option (a) is INCORRECT:** This is an exaggerated and overly specific interpretation of the passage.
- **Option (b) is CORRECT:** The passage mentions rising sea levels as one of the key effects of global warming and links this to an increase in severe climatic events like floods, hurricanes, and storms. This statement reflects the overall concern of the passage about the intensifying impact of global warming on India.
- **Option (c) is INCORRECT:** The statement is absolute.
- **Option (d) is INCORRECT:** While the passage mentions rising temperatures on the Tibetan Plateau and their role in melting Himalayan glaciers, the focus of the passage is not on the Tibetan Plateau alone. It is more about the larger impacts of global warming on India, including floods, storms, and food security.

3) **Answer: (d)**

**Difficulty Level: Easy**

- **Assumption 1 is CORRECT:** This assumption reflects the viewpoint of critics mentioned in the passage. It is valid as the perception of boxing's intent to harm is presented as a central reason for the criticism it receives.
- **Assumption 2 is CORRECT:** This assumption is explicitly stated in the passage, where supporters of boxing argue that injuries are unintended consequences rather than a fundamental aim.
- **Assumption 3 is CORRECT:** The passage clearly highlights that boxing faces more scrutiny than other sports with higher fatalities and injuries.

4) **Answer: (d)**

**Difficulty Level: Easy**

- **Option (a) is INCORRECT:** This option is not the best choice because the passage does not directly argue that boxing is inherently brutal; it focuses more on the differing perceptions of whether harm is intentional or not.
- **Option (b) is INCORRECT:** This is not the best choice either because while the passage mentions that motor racing and equestrian events have more fatalities, the main point



is not about comparing the fatality rates between sports. Instead, the passage is concerned with the public's perception of boxing.

- **Option (c) is INCORRECT:** The passage does not advocate for the prohibition of dangerous sports; it discusses the differing opinions about the intent behind injuries in boxing.
- **Option (d) is CORRECT:** The crux of the passage is that there is a divide between critics who see the intent to harm as inherent in boxing and supporters who view injuries as accidental consequences of the competition.

5) **Answer: (c)**

**Difficulty Level : Easy**

**Micro Topic : Place value**

**Explanation:**

Given, total number of pages = 192

Consider numbers from 1 to 100

Number of nines in units place = Number of nines in units place in 9, 19, 29, ..., 99  
= 10

Number of nines in tens place = Number of nines in tens place in 90, 91, 92, ..., 99  
= 10

Similarly, consider numbers from 101 to 192

Number of nines in units place = Number of nines in units place in 109, 119, 129, ..., 189  
= 9

Number of nines in tens place = Number of nines in tens place in 190, 191, 192  
= 3

Number of nines in hundreds place = 0

⇒ Required number of nines = 10 + 10 + 9 + 3 = 32

6) **Answer: (c)**

**Difficulty Level : Moderate**

**Micro Topic : Factorization**

**Explanation:**

Given,  $3m + 64$  is divisible by  $m$ .

Let 'p' be its solution.

$$\Rightarrow \frac{3m + 64}{m} = p$$

$$\Rightarrow pm = 3m + 64$$

$$\Rightarrow m = \frac{64}{p - 3}$$

As, 'm' is a positive integer, 'p - 3' must divide 64 completely.

We know that, factors of 64 are 1, 2, 4, 8, 16, 32, 64

⇒ 'm' can be any of these 7 values.

Therefore, number of possible values of 'm' = 7

7) **Answer: (b)**

**Difficulty Level : Easy**

**Micro Topic : Unit Digit/ Last Digit**

**Explanation:**

Given numbers are ,6783,7482,5217,9375



Whenever there is an even number and a digit 5 in the units place, the final product of numbers will have 0 as the units digit.

Here 7482 and 9375 have 2 and 5 respectively as the units digit.

$$As 2 \times 5 = 10,$$

7482  $\times$  9375 will have 0 at units place.

Multiplying this solution with any other number will only give 0 as the units digit.

Hence required number = 0

**8) Answer: (d)**

**Difficulty Level : Easy**

**Micro Topic : Factorization**

**Explanation:**

$$\text{Factors of } 22392 = 2^2 \times 3^2 \times 7^2 \times 13$$

If we divide by 13 or multiply by 13 it will become a perfect square.

Therefore the least number is 13.

**9) Answer: (a)**

**Difficulty Level : Difficult**

**Micro Topic : Remainder Theorem**

**Explanation:**

Divisibility test for 11-Starting from the right side split the number into the pairs like two-digit numbers; if any digit is left unpaired the left side of the original number take it as a single digit number. If the sum of all these numbers is divisible by 11, then the given number will also be divisible by 11.

Here in the given number N, 97 is repeated certain number of times

Pairing from the right side, number of repetitions = 40

$$\Rightarrow \text{Total } \sum 40 \times 97 = 3880$$

Now repeat the pairing process again, as the number is large.

(38, 80)

On adding, sum = 118

On dividing 118 by 11

$$\begin{array}{r} 10 \\ 11 \overline{) 118} \\ \underline{11} \phantom{0} \\ 08 \\ \underline{00} \\ 8 \end{array}$$

the remainder will be 8

Therefore required remainder = 8



**10) Answer: (c)**

**Difficulty Level : Moderate**

**Micro Topic : Factorization**

**Explanation:**

Given,

$$x + y > xy \quad (1)$$

(1) alone won't be sufficient to find answer as there are infinite number of possibilities

$$\frac{y}{x} = 36 \quad (2)$$

(2) alone won't be sufficient to find answer as there are infinite number of possibilities

From (2), possible values of (y, X) are (1, 36), (2, 72), (3, 108),.....

We have to choose the pair which satisfies (1)

Choose (1, 36)

$$\Rightarrow 36 + 1 > 36 \times 1$$

Therefore (1, 36) satisfies both (1) and (2)

So both statements are required to give the answer

**11) Answer: (d)**

**Difficulty Level: Hard**

- **Assumption 1 is INCORRECT:** The passage does not suggest that development and human rights are inherently in conflict. Instead, it emphasizes that development must respect and uphold human rights to be sustainable.
- **Assumption 2 is INCORRECT:** The passage does not explicitly state that human rights are universally agreed upon or understood. It simply describes them as entitlements inherent to every individual.
- **Assumption 3 is INCORRECT:** The passage clearly supports this assumption by stating that human rights "empower us to fully realize our potential by nurturing our intelligence, talents, and conscience." This suggests that respecting and upholding human rights can indeed be a catalyst for personal growth. So, this assumption is valid.

**12) Answer: (c)**

**Difficulty Level: Easy**

- **Option (a) is INCORRECT:** While this is a valid idea about human rights, the passage does not discuss their evolution or changing nature. The focus is instead on their fundamental and universal nature as inherent entitlements essential for dignity and potential.
- **Option (b) is INCORRECT:** The passage does not focus on the State's responsibility. Instead, it emphasizes the intrinsic nature of human rights and their role in personal empowerment and dignity.
- **Option (c) is CORRECT:** This statement directly addresses the central theme of the passage, which is the role of human rights in enabling individuals to live with dignity, nurture their talents, and achieve their full potential. The idea of "embracing their humanity" aligns with the passage's focus on the inherent and universal nature of these rights.
- **Option (d) is INCORRECT:** The passage begins by mentioning science and technology, but only to contrast it with human rights, stating that true progress is not sustainable



without respecting human rights. The passage does not explore how science and technology can promote human rights.

**13) Answer: (d)**

**Difficulty Level: Easy**

- **Assumption 1 is CORRECT:** This assumption is valid as the passage explicitly mentions that poverty, traditions, and religious practices act as barriers to children's aspirations and achievements.
- **Assumption 2 is CORRECT:** This assumption is valid because the passage highlights that various countries have demonstrated the success of political action and grassroots movements in overcoming societal constraints.
- **Assumption 3 is CORRECT:** This assumption is valid since the passage states that governments, international organizations, and elites often use societal constraints as excuses for their inaction, thereby stalling progress.

**14) Answer: (c)**

**Difficulty Level: Hard**

- **Option (a) is INCORRECT:** The passage does mention that public policies have failed to address these critical constraints, but this statement focuses only on policy shortcomings, whereas the passage emphasizes overcoming these constraints through political action and grassroots movements. While it's a valid point, it doesn't capture the full essence of the passage, which also highlights the potential for change.
- **Option (b) is INCORRECT:** The passage does identify these as barriers, but it goes beyond just stating them as primary factors. It emphasizes that these barriers can be overcome with political action and social movements. This statement alone does not fully reflect the passage's focus on solutions.
- **Option (c) is CORRECT:** This aligns most closely with the passage's emphasis on political action, grassroots movements, and the need to harness energy for meaningful change. It best reflects the crux of the passage, focusing on the role of political and grassroots efforts.
- **Option (d) is INCORRECT:** The passage mentions that governments, international organizations, and elites have hidden behind excuses, but the passage also calls for action. While this statement highlights a significant issue, it focuses only on the problem and not the proposed solution or the progress made in other countries.

**15) Answer: (b)**

**Difficulty Level : Moderate**

**Micro Topic : Law of divisibility**

**Explanation:**

Numbers divisible by 2 =  $\left[\frac{500}{2}\right] = 250$  in number

Numbers divisible by 3 =  $\left[\frac{498}{3}\right] = 166$  in number { 498 is taken as it is the multiple of 3 nearest to 500}

Numbers divisible by 7 =  $\left[\frac{497}{7}\right] = 71$  in number { 497 is taken as it is the multiple of 7 nearest to 500}



$$\text{Therefore total} = 250 + 166 + 71 = 487 \quad (1)$$

Now, Numbers divisible by both 2 and 3 = Numbers divisible by 6  
 $= \left[ \frac{498}{6} \right] = 83$  in number { 498 is taken as it is the multiple of 6 nearest to 500}

Numbers divisible by both 2 and 7 = Numbers divisible by 14  
 $= \left[ \frac{490}{14} \right] = 35$  in number { 490 is taken as it is the multiple of 14 nearest to 500}

Numbers divisible by both 3 and 7 = Numbers divisible by 21  
 $= \left[ \frac{483}{21} \right] = 23$  in number { 483 is taken as it is the multiple of 21 nearest to 500}

$$\text{Here total} = 83 + 35 + 23 = 141 \quad (2)$$

Now, Numbers divisible by all 2, 3 and 7 = Numbers divisible by 42  
 $= \left[ \frac{462}{42} \right] = 11$  in number { 462 is taken as it is the multiple of 42 nearest to 500}

$$\text{Here, total} = 11 \quad (3)$$

$$\text{Therefore, Numbers not divisible by 2,3 or 7} = 500 - (487 - 141 + 11) = 143$$

### 16) Answer: (a)

**Difficulty Level : Moderate**

**Micro Topic : Remainder Theorem**

**Explanation:**

According to the question,

$$m = 5p + 4 \quad (1)$$

$$\text{Also } m = 7q + 4 \quad (2)$$

From (1) and (2),

$$5p = 7q$$

Least possible values of p and q which satisfies this is p = 7 and q = 5

$$\Rightarrow 5p = 7q = 5 \times 7 = 35$$

$$\Rightarrow m = 35 + 4 = 39$$

Similarly for n,

$$n = 5a + 3$$

$$\text{Also } n = 7b + 3$$

Similar to the above situation, the least possible values of a and b which satisfies this is a = 7 and b = 5

$$\Rightarrow 5a = 7b = 5 \times 7 = 35$$

$$\Rightarrow n = 35 + 3 = 38$$

$$\text{Therefore } n - m = 38 - 39 = -1$$



**17) Answer: (c)**

**Difficulty Level : Easy**

**Micro Topic : Types of numbers**

**Explanation:**

We know that the prime numbers are 2,3,5,7,11,.....

Choose  $n = 2$

$$\Rightarrow n + 1 = 3, n + 3 = 5, n + 5 = 7$$

Therefore 2 satisfies the condition.

If we assign any other value of prime number to  $n$ , then  $n+1$  won't be a prime number.

So possible values of  $n$  is 1

**18) Answer: (a)**

**Difficulty Level : Moderate**

**Micro Topic : Types of numbers**

**Explanation:**

Given,  $17y(x - 10)$

As  $y$  is odd  $17 \times y$  is odd

$x$  is odd;  $\Rightarrow x - 10$  is also odd

We know that product of an odd number by an odd number gives another odd number as solution.

$17y(x - 10)$  is odd.  $\Rightarrow$  **statement 1 is wrong**

Now, in  $x^2y^2 + z^2$ ,  $x^2y^2$  is odd as  $y$  and  $x$  are odd and the square of odd number is an odd number.

Odd + even = odd

So,  $x^2y^2 + z^2$  is odd  $\Rightarrow$  **statement 2 is right**

Consider,  $(z - x)^3 - y$

Even - Odd = Odd

$\Rightarrow z - x$  is odd.

Cube of an odd number is also odd. Therefore  $(z - x)^3$  is odd.

Odd - Odd = Even

$\Rightarrow (z - x)^3 - y$  is even. So, **statement 3 is wrong.**

Therefore only one statement is correct.

**19) Answer: (b)**

**Difficulty Level : Difficult**

**Micro Topic : Number of zeroes**

**Explanation:**

To find the number of zeroes, we need to find the number of 10s in this product.

$$10 = 2 \times 5$$

$\Rightarrow$  Number of zeroes = Number of combinations of  $2 \times 5$

$$6^4 = 2^4 \times 3^4 \quad (\text{Number of 2s} = 4)$$

$$12^8 = 4^8 \times 3^8 = 2^{16} \times 3^8 \quad (\text{Number of 2s} = 16)$$

$$15^{10} = 5^{10} \times 3^{10} \quad (\text{Number of 5s} = 10)$$

$$18^{12} = 2^{12} \times 9^{12} \quad (\text{Number of 2s} = 12)$$



$24^{14} = 8^{14} \times 3^{14} \quad 2^{42} \times 3^{14}$  (Number of 2s = 42)  
 $30^{20} = 5^{20} \times 6^{20} = 5^{20} \times 3^{20} \times 2^{20}$  (Number of 2s = 20), (Number of 5s = 20)  
Total number of 2s =  $4+16+12+42+20 = 94$   
Total number of 5s =  $10+20 = 30$   
 $\Rightarrow$  Total number of combinations of  $2 \times 5 =$  minimum value of  $(30,94) = 30$

**20) Answer: (c)**

**Difficulty Level : Moderate**

**Micro Topic : Unit Digit/ Last Digit**

**Explanation:**

The last digit at the units place for the number  $4^{52^{52}} \times 9^{52^{52}}$   
= last digit at the units place for the number  $36^{52^{52}}$   
= last digit at the units place for the number  $6^{52^{52}}$   
Now,  
6 raised to any number will give solution with units digit as 6  
( $6^2 = 36$ ;  $6^3 = 216$ ;  $6^4 = 1296$ )  
Therefore, last digit at the units place = 6

**21) Answer: (a)**

**Difficulty Level: Hard**

- **Assumption 1 is CORRECT:** The passage explicitly mentions that HDR resources are accessible with current drilling technology, although there are economic challenges with deeper wells.
- **Assumption 2 is INCORRECT:** While the passage mentions deep artificial reservoirs, it doesn't claim they are the key to unlocking HDR resources; it focuses on the potential of HDR and the economic challenges of accessing it.
- **Assumption 3 is INCORRECT:** The geothermal gradient is discussed, but the passage does not suggest it is the primary limiting factor; it focuses more on the economic challenges related to depth.

**22) Answer: (a)**

**Difficulty Level: Medium**

- **Option (a) is CORRECT:** This option captures the main point of the passage, which highlights both the potential energy of HDR resources and the economic challenges involved in accessing them.
- **Option (b) is INCORRECT:** While deep artificial reservoirs are mentioned, the passage focuses more on the potential of HDR resources and the economic challenges, rather than emphasizing the need for artificial reservoirs.
- **Option (c) is INCORRECT:** The passage states that HDR resources are accessible with current technology, though deeper wells face economic challenges, so this option overstates the inaccessibility.
- **Option (d) is INCORRECT:** The geothermal gradient is mentioned as a factor in drilling depth, but the passage does not suggest that the gradient is the primary limiting factor for energy extraction.



**23) Answer: (c)**

**Difficulty Level: Hard**

- **Option (a) is INCORRECT:** While aluminium was once considered a precious metal, the passage does not focus on its reactivity as the reason for this.
- **Option (b) is INCORRECT:** Although aluminium's reactivity prevents it from being found in pure form, this is not the primary focus of the passage.
- **Option (c) is CORRECT:** This accurately captures the key point of the passage, which emphasizes how the development of an electrolytic process significantly reduced aluminium production costs.
- **Option (d) is INCORRECT:** The passage discusses synthetic cryolite as a replacement but does not state that aluminium is cheaper than gold or platinum because of this.

**24) Answer: (a)**

**Difficulty Level : Easy**

**Micro Topic : Law of divisibility**

**Explanation:**

**Given number is,**

$$\text{Let } X = 10^a - 1$$

Values of X for different values of a

$$a = 1 \Rightarrow X = 9$$

$$a = 2 \Rightarrow X = 99$$

$$a = 3 \Rightarrow X = 999$$

$$a = 4 \Rightarrow X = 9999 \text{ and so on.}$$

Here values of X divisible by 11 are 99 and 9999 which corresponds to  $a=2$  and  $a=4$

So, number  $10^a - 1$  is divisible by 11 for even values of a

**25) Answer: (d)**

**Difficulty Level : Easy**

**Micro Topic : Types of numbers**

**Explanation:**

Given, m is a prime number

$\Rightarrow$  Possible values of m = 2, 3, 5, 7, 11, .....

Whenever any prime number is squared, the units digit will be one among the following values  $\Rightarrow$  1, 9, 4 (only for  $m = 2$ ), 5 (only for  $m = 5$ )

So,

$$m^2 + 1 \text{ can have units digit} = 2, 0, 5, 6$$

$$\Rightarrow m^2 + 1 \text{ can't have units digit } 7$$

**26) Answer: (d)**

**Difficulty Level : Moderate**

**Micro Topic : Law of divisibility**

**Explanation:**

A number can be divisible by 7, 11 and 13 if and only if the difference of the number formed by the last three digits and the number formed by the rest digits is 0 or divisible by 7, 11 and 13 respectively.

Here,



Number formed by the last three digits = XYZ  
Number formed by the rest digits = XYZ  
Difference = 0, which is divisible by 7, 11 and 13.  
So, it is divisible by all 7, 11 and 13

**27) Answer: (d)**

**Difficulty level: Hard**

**Micro Topic: Number system – Decimal Expansion fractions**

**Statement I is incorrect:** Sum of two repeating, infinite decimal need not be repeating, infinite. For eg:  $0.\overline{666} + 0.\overline{333} = 1.0$ .

**Statement II is correct:** For eg:  $1000x = ABC.ABCABCABC\dots$

$$1000x - x = 999x = ABC$$

Thus,  $x = \frac{ABC}{999}$  (a fraction).

**28) Answer: (c)**

**Difficulty Level : Difficult**

**Micro Topic : Place Value**

**Explanation:**

Given number is aba.

It is a 3-digit number. Here a 3-digit number raised to number c gives a 5-digit number abcba.

We have 3-digit numbers from 100 to 999.

Consider the minimum value 100.

$$100^1 = 100$$

$$100^2 = 10000$$

$$100^3 = 1000000$$

Here the 5-digit solution is obtained only when we square a 3-digit number.

Therefore value of c has to be 2

$$\text{Now } aba = (100a + 10b + a)$$

$$= 101a + 10b \quad (1)$$

Possible values for (1) are 101, 131, 141, .....(121 avoided as  $c = 2$ )

Now if we choose 101,

$$101^2 = 10201$$

$$\Rightarrow a = 1, b = 0, c = 2$$

$$\text{So, } a + b + c = 3$$

**29) Answer: (d)**

**Difficulty Level : Easy**

**Micro Topic : Place value**

**Explanation:**

Let the 3-digit number be  $ABC = (100A + 10B + C)$

Number formed by reversing its digit =  $(100C + 10B + A)$

Given,

Difference between the two numbers = 495

$$\Rightarrow (100A + 10B + C) - (100C + 10B + A) = 495$$

$$\Rightarrow 99A - 99C = 495$$



$$\Rightarrow A - C = 5$$

Possible values of (A, C) = (6,1),(7,2),(8,3),(9,4)

Sum of A+B+C will be least when A= 6, B=0, C=1

Therefore Sum = 7

**30) Answer: (b)**

**Difficulty Level : Easy**

**Micro Topic : Law of divisibility**

**Explanation:**

Let the number be xyz.

According to the question,

$x+y+z$  is subtracted from  $100x+10y+z$ .

$$\begin{aligned} \text{Therefore, } (100x+10y+z) - (x+y+z) &= 99x + 9y \\ &= 9(11x + y) \end{aligned}$$

This number will be always divisible by 9

**31) Answer: (b)**

**Difficulty Level: Easy**

- **Assumption 1 is INCORRECT:** The passage clearly states that ethics plays a key role in the formation of laws, indicating that ethics is not solely about personal values.
- **Assumption 2 is INCORRECT:** The passage specifies that public servants are held to stricter standards than ordinary citizens, making this assumption wrong.
- **Assumption 3 is CORRECT:** The passage supports the idea that ethics and laws are interconnected, with ethics influencing the creation of laws and ensuring accountability for public officials.

**32) Answer: (a)**

**Difficulty Level: Easy**

- **Option (a) is CORRECT:** The passage emphasizes that ethics play a crucial role in ensuring that public officials use their power in the best interest of the people, which is captured in this option.
- **Option (b) is INCORRECT:** The passage does not directly state that laws reflect the opinions of the people, but rather that ethics shape laws.
- **Option (c) is INCORRECT:** It focuses on public servants being held to higher standards, but does not encompass the full message about the role of ethics in public life.
- **Option (d) is INCORRECT:** The passage does not mention this.

**33) Answer: (a)**

**Difficulty Level: Easy**

- **Assumption 1 is CORRECT:** The passage implies that television's initial potential to democratize information was overshadowed by commercial interests prioritizing entertainment over intellectual content.
- **Assumption 2 is CORRECT:** The passage suggests that television ownership was initially concentrated in wealthier households, limiting its accessibility and reinforcing societal divisions, particularly in rural areas.



- **Assumption 3 is INCORRECT:** The passage clearly states that television reinforced gender stereotypes and offered reductive portrayals of racial minorities, making this assumption false.

**34) Answer: (b)**

**Difficulty Level: Easy**

- **Option (a) is INCORRECT:** While the passage mentions the prioritization of entertainment, it focuses more broadly on the failure to democratize information and the societal impact of television.
- **Option (b) is CORRECT:** This option best summarizes the central idea of the passage, which critiques television for its failure to democratize information, despite its initial promise, due to commercialization, biased programming, and lack of accessibility.
- **Option (c) is INCORRECT:** The passage does not focus solely on this point.
- **Option (d) is INCORRECT:** While television ownership was initially concentrated in wealthier households, the passage does not focus solely on this point but rather on the broader issues of television's impact.

**35) Answer: (d)**

**Difficulty Level : Difficult**

**Micro Topic : Remainder Theorem**

**Explanation:**

Given number is,

$$(2)^{50 \times 49 \times \dots \times 2 \times 1} = (2)^{5 \times 10 \times 49 \times \dots \times 2 \times 1} \\ = (32)^{10 \times 49 \times \dots \times 2 \times 1}$$

**Remember,  $\frac{(a+1)^n}{a}$  will always give remainder `1**

Therefore,  $\frac{(32)^{10 \times 49 \times \dots \times 2 \times 1}}{31}$  will have remainder = 1

**36) Answer: (c)**

**Explanation:**

Consider statement 1,

Let  $x, x + 1, x + 2, x + 3, x + 4$  be 5 consecutive integers.

Given,

Sum = 70

$$\Rightarrow 5x + 10 = 70$$

$$\Rightarrow x = \frac{60}{5} = 12$$

Therefore numbers are 12, 13, 14, 15, 16.

So statement 1 is true.

Consider statement 2,

Let  $x, x + 1$  be 2 consecutive natural numbers.

According to the question, we have to check for any natural numbers such that,

$$x(x + 1) < x + x + 1$$



Put  $x = 1$

$$\Rightarrow 2 < 3$$

$\Rightarrow$  Equation holds true for  $x = 1$

So statement 2 is true.

**37) Answer: (b)**

**Explanation:**

Given equation is  $y^2 + 19y - 150 = 0$

$$\Rightarrow y^2 + 25y - 6y - 150 = 0$$

$$\Rightarrow y(y + 25) - 6(y + 25) = 0$$

$$\Rightarrow y = -25; y = 6$$

$$\Rightarrow a = -25; b = 6$$

Therefore,  $a^2 + b^2 = (-25)^2 + 6^2 = 661$

**38) Answer: (c)**

**Difficulty Level: Easy**

**Micro Topic: Coding and Decoding**

Given:

"HOUSE"  $\rightarrow$  "KRYVH"

Step 1: Identify the Pattern

Comparing each letter of HOUSE with KRYVH:

- H  $\rightarrow$  K (+3)
- O  $\rightarrow$  R (+3)
- U  $\rightarrow$  Y (+4)
- S  $\rightarrow$  V (+3)
- E  $\rightarrow$  H (+3)

The pattern follows shifts: (+3, +3, +4, +3, +3).

Step 2: Apply the Pattern to "PLANE"

Using the same shifts (+3, +3, +4, +3, +3):

- P  $\rightarrow$  S (+3)
- L  $\rightarrow$  O (+3)
- A  $\rightarrow$  E (+4)
- N  $\rightarrow$  Q (+3)
- E  $\rightarrow$  H (+3)

Thus, "PLANE"  $\rightarrow$  "SOEQH".

**39) Answer: (c)**

**Difficulty level: Easy - Medium**

**Micro Topics: Number system-Roots**

We are given that  $x$  is a positive integer satisfying the following conditions:

1.  $\sqrt{x}$  is an integer, meaning  $x$  must be a **perfect square**.
2.  $\sqrt[3]{x}$  is an integer, meaning  $x$  must be a **perfect cube**.
3.  $x$  is **divisible by 12**.

**Step 1: Checking if  $x$  is always divisible by 216**



Since  $x$  is both a perfect square and a perfect cube, it must be a **perfect sixth power** (i.e.,  $x = k^6$  for some integer  $k$ ).

Since  $x$  is divisible by 12, it must be divisible by 6, meaning  $x = (6m)^6 = 6^6 m^6$ .

Since  $x$  contains at least  **$2^6$  and  $3^6$ , which include  $2^3$  and  $3^3$ ,  $x$  is always divisible by 216.** ( $2^3 \times 3^3 = 216$ )

Thus, **Statement 1 is correct.**

**Step 2: Checking the sum of digits divisibility by 9**

We are given that:

$$x = [6m]^6 = 6^6 \times m^6$$

Since:

$$6^6 = (2 \times 3)^6 = 2^6 \times 3^6$$

we can rewrite  $x$  as:

$$x = 2^6 \times 3^6 \times m^6$$

For a number to be divisible by **9**, it must contain **at least two factors of 3** (i.e., be divisible by  $3^2 = 9$ ).

The term  $3^6$ , ensures that  $x$  is always divisible by 9 (since  $3^6 = (3^2)^3$  and  $3^2 = 9$ ).

Since  $x$  is always divisible by 9, its **sum of digits must also be divisible by 9** (a fundamental property of numbers divisible by 9).

Thus, **Statement 2 is correct.**

Thus, the correct answer is: (c) **Both 1 and 2 are correct**

**40) Answer: (c)**

**Difficulty level: Medium**

**Micro Topic: Number systems – LCM**

We need to find the largest possible number of items in a warehouse that, when divided by 12, 14, 18, and 20, leaves remainders of 5, 7, 11, and 13, respectively.

- When divided by 12, remainder = 5 → Difference:  $12 - 5 = 7$
- When divided by 14, remainder = 7 → Difference:  $14 - 7 = 7$
- When divided by 18, remainder = 11 → Difference:  $18 - 11 = 7$
- When divided by 20, remainder = 13 → Difference:  $20 - 13 = 7$

This pattern suggests that the total number of items is **7 less than a common multiple of 12, 14, 18, and 20.**

$$\text{LCM} = 2^2 \times 3^2 \times 5^1 \times 7^1 = 1260$$

Since the total number of items in the warehouse must be **less than 10,000**, we need to find the largest multiple of 1260 that does not exceed 9,999.

Dividing 9,999 by 1260:

$$\frac{9999}{1260} \approx 7.93$$

The greatest integer value that keeps the total within four digits is **30**, so the largest multiple of 330 under 10,000 is:

$$1260 \times 7 = 8820$$

Since the given conditions indicate that the number must be **7 less than a multiple of 330**, we subtract:

$$8820 - 7 = 8813$$

Thus, the largest possible number of items in the warehouse that meets all conditions is **8813**



41) Answer: (d)

**Difficulty Level: Medium**

- **Statement 1 is CORRECT:** The passage mentions that a majority share of the current R&D investment comes from public research.
- **Statement 2 is INCORRECT:** The passage mentions that these programs need further maturity in transparency and outcomes, implying they are not yet fully transparent or yielding predictable results.
- **Statement 3 is CORRECT:** The passage emphasizes the need to increase R&D investment, which is essential for fostering innovation and technological growth.

42) Answer: (a)

**Difficulty Level: Easy**

- **Option (a) is INCORRECT:** The passage highlights the importance of doubling R&D investment, pointing out the current underinvestment and its implications for future growth.
- **Option (b) is INCORRECT:** The passage doesn't suggest a shift from private to public funding but calls for an increase in both public and private investments.
- **Option (c) is CORRECT:** The passage does not imply this.
- **Option (d) is INCORRECT:** The passage does not imply this.

43) Answer: (b)

**Difficulty Level: Easy**

- **Statement 1 is INCORRECT:** The passage clearly indicates that the transition from colonialism was far from smooth, with many states facing significant challenges in governance.
- **Statement 2 is CORRECT:** The passage highlights that many post-colonial states struggled with internal divisions and external influences, leading to political fragmentation and instability.
- **Statement 3 is INCORRECT:** The passage does not directly state that the failure to uphold anti-colonial ideals caused political fragmentation and civil wars; instead, it suggests that governance challenges and the legacy of colonialism played a larger role.

44) Answer: (a)

**Difficulty Level: Easy**

- **Option (a) is CORRECT:** This statement encapsulates the main idea of the passage, which highlights the challenges of governance, internal divisions, and the entrenchment of neo-colonial influences in post-colonial societies.
- **Option (b) is INCORRECT:** While the passage mentions arbitrary borders as a contributing factor, it is not the central focus.
- **Option (c) is INCORRECT:** Economic instability is mentioned, but the passage emphasizes broader governance challenges and political fragmentation.
- **Option (d) is INCORRECT:** The passage does not mention this.



**45) Answer: (c)**

**Difficulty level: Medium**

**Micro Topic: Number systems – HCF**

To determine the longest possible length of a metal piece that can be used to cut both rods into equal smaller pieces without any leftover material, we need to find the **Highest Common Factor (HCF)** of the lengths of rods X and Y.

**1. Statement-I alone (difference between X and Y is 18 cm):**

- This gives  $X - Y = 18$ , but there are infinitely many pairs of numbers with a difference of 18. Without additional information, we cannot determine the HCF.
- **Conclusion:** Statement-I alone is insufficient.

**2. Statement-II alone (product of X and Y is 1944 cm<sup>2</sup>):**

- This gives  $X \times Y = 1944$ , but there are multiple pairs of numbers whose product is 1944. Without additional information, we cannot determine the HCF.
- **Conclusion:** Statement-II alone is insufficient.

**3. Combining Statement-I and Statement-II:**

- From Statement-I:  $X - Y = 18$ .
- From Statement-II:  $X \times Y = 1944$ .
- Let  $Y = y$ . Then  $X = y + 18$ .
- Substitute  $X = y + 18$  into  $X \times Y = 1944$ :

$$(y + 18) \times y = 1944$$

$$y^2 + 18y - 1944 = 0$$

$$y^2 + 18y - 1944 = 0$$

- Solve the quadratic equation  $y^2 + 18y - 1944 = 0$

$$y(y + 54) - 36(y + 54) = 0$$

$$(y - 36)(y + 54) = 0$$

$$y = 36 \text{ or } y = -54$$

- Since length cannot be negative,  $y = 36$
- Substitute  $y = 36$  into  $X = y + 18$ :  
$$X = 36 + 18 = 54$$
- Now, we know the lengths of X and Y:  
$$X = 54 \text{ cm and } Y = 36 \text{ cm.}$$
- The HCF of 54 and 36 is **18 cm**, which is the longest possible length that can evenly divide both rods.

**46) Answer: (b)**

**Difficulty Level: Easy**

**Micro Topics: Work and Time**

**Ravi's Work Rate:**

Ravi can paint  $\frac{2}{3}$  of the house in 6 days.

Work rate =  $\frac{\frac{2}{3}}{6} = \frac{2}{18} = \frac{1}{9}$  house per day.

**Amit's Work Rate:**

Amit can paint  $\frac{1}{3}$  of the house in 8 days.

Work rate =  $\frac{\frac{1}{3}}{8} = \frac{1}{24}$  house per day.

**Suraj's Work Rate:**



Suraj can paint  $\frac{3}{4}$  of the house in 12 days.

$$\text{Work rate} = \frac{\frac{3}{4}}{12} = \frac{3}{48} = \frac{1}{16} \text{ house per day.}$$

### Calculate Combined Work Rate

- Combined work rate = Ravi's rate + Amit's rate + Suraj's rate  
$$= \frac{1}{9} + \frac{1}{24} + \frac{1}{16} = \frac{16+6+9}{144} = \frac{31}{144} \text{ house per day}$$

### Work Done in 4 Days Together

- Work done in 4 days = Combined work rate  $\times$  4
- Work done =  $\frac{31}{144} \times 4 = \frac{31}{36}$  of the house.

### Remaining Work

- Total work = 1 house
- Remaining work =  $1 - \frac{31}{36} = \frac{5}{36}$  of the house.

### Time for Amit to Complete Remaining Work Alone

- Amit's work rate =  $\frac{1}{24}$  house per day.
- Time required =  $\frac{\frac{5}{36}}{\frac{1}{24}} = \frac{5}{36} \times 24 = \frac{120}{36} = \frac{10}{3} \approx 3.33 \text{ days}$

Therefore, Amit will need approximately **3.33 days** to finish the remaining work alone.

## 47) Answer: (c)

**Difficulty Level: Medium**

**Micro Topic: Work and Time**

- Let **1 woman** complete the job in **w days**, so her work rate is  $\frac{1}{w}$  job/day.
- Let **1 man** complete the job in **m days**, so his work rate is  $\frac{1}{m}$  job/day.

**From the first statement:**

- 3 women and 2 men together complete the work in **6 days**, so their combined rate is:

$$3 \times \frac{1}{w} + 2 \times \frac{1}{m} = \frac{1}{6}$$
$$\frac{3}{w} + \frac{2}{m} = \frac{1}{6} \rightarrow \text{Equation 1}$$

**From the second statement:**

- 3 men complete the job **5 days sooner** than 9 women.
- That means the time taken by 3 men is **m/3 days**, and the time taken by 9 women is **w/9 days**.
- Since 3 men finish the job 5 days earlier than 9 women:

$$\frac{m}{3} + 5 = \frac{w}{9}$$
$$\frac{w}{9} - \frac{m}{3} = 5 \rightarrow \text{Equation 2}$$

**Solve for w and m**

**Solve for w**



From Equation (2):

$$\frac{w}{9} = \frac{m}{3} + 5$$
$$w = 3m + 45$$

**Substitute into Equation (1)**

$$\frac{3}{w} + \frac{2}{m} = \frac{1}{6}$$

Substituting  $w = 3m + 45$ :

$$\frac{3}{3m + 45} + \frac{2}{m} = \frac{1}{6}$$
$$18m + 306m + 540 = 3m^2 + 45m$$
$$54m + 540 = 3m^2 + 45m$$
$$3m^2 - 9m - 540 = 0$$
$$m^2 - 3m - 180 = 0$$
$$m = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-180)}}{2(1)}$$
$$m = \frac{3 \pm \sqrt{9 + 720}}{2}$$
$$m = \frac{3 \pm \sqrt{729}}{2}$$
$$m = \frac{3 \pm 27}{2}$$

Taking the positive root:

$$m = \frac{3 + 27}{2} = \frac{30}{2} = 15$$

**Solve for  $w$**

$$w = 3(15) + 45 = 90$$

**Find  $\frac{w}{m}$**

$$\frac{w}{m} = \frac{90}{15} = 6$$

Thus, **a man's output is 6 times that of a woman.**

- **Statement-I alone** gives one equation with two variables (not sufficient).
- **Statement-II alone** gives another equation with two variables (not sufficient).
- **Using both statements together**, we solve for  $w$  and  $m$ , so they are **sufficient together**.

Thus, the correct answer is: **(c) The Question can be answered by using both the Statements together, but cannot be answered using either Statement alone.**

**48) Answer: (a)**

**Difficulty Level: Easy**

**Micro Topic: Pipes and Cistern**

**Define the Rates**

**1. First inlet pipe:**

- Fills the tank in 15 minutes.
- Rate =  $\frac{1}{15}$  tank per minute.



**2. Second inlet pipe:**

- Fills the tank in 10 minutes.
- Rate =  $\frac{1}{10}$  tank per minute.

**3. Outlet pipe:**

- Drains the tank in 30 minutes.
- Rate =  $-\frac{1}{30}$  tank per minute (negative because it drains the tank).

**Combined Rate**

When all three pipes are open, their rates add up:

$$\text{Combined rate} = \frac{1}{15} + \frac{1}{10} - \frac{1}{30} = \frac{2}{30} + \frac{3}{30} - \frac{1}{30} = \frac{4}{30} = \frac{2}{15} = 7\frac{1}{2} \text{ minutes}$$

**Hence the correct answer is option (a)  $7\frac{1}{2}$  minutes**

**49) Answer: (d)**

**Difficulty Level: Medium-Difficult**

**Micro Topic: Permutations and Combinations-Permutations**

We need to determine the smallest number **n** such that **any n balls drawn must include all the balls of at least one colour.**

The bag contains:

- **12 red balls**
- **18 blue balls**
- **24 green balls**
- **30 yellow balls**
- **36 black balls**
- **40 white balls**

**Worst-Case Scenario**

To ensure that **at least one full group (colour) is completely picked**, we consider the worst case:

- Suppose we pick as many balls as possible without completing a full group.
- This means picking the maximum number of balls from each colour **without** fully selecting any one colour.

This happens when we take:

- **11 out of 12 red balls**
- **17 out of 18 blue balls**
- **23 out of 24 green balls**
- **29 out of 30 yellow balls**
- **35 out of 36 black balls**
- **39 out of 40 white balls**

Thus, the total balls picked so far:

$$11 + 17 + 23 + 29 + 35 + 39 = 154$$

If we pick **one more ball (n = 155)**, it must complete at least one colour group.

So, **statement 1 is incorrect** because **n should be 155, not 150.**

We need to determine the smallest number **m** such that **any m balls drawn must contain at least one ball of each colour.**

**Worst-Case Scenario**



To avoid getting all six colours, the worst-case scenario would be taking as many balls as possible from only **five** colours while completely avoiding one colour.

This means picking:

- **All 40 white balls**
- **All 36 black balls**
- **All 30 yellow balls**
- **All 24 green balls**
- **All 18 blue balls**

Total so far:

$$40 + 36 + 30 + 24 + 18 = 148$$

If we pick **one more ball (m = 149)**, it must come from the remaining colour (red), ensuring at least one ball of each colour.

So, **statement 2 is incorrect** because **m should be 149, not 140**.

Since both values in the statements are incorrect, the correct option is: **(d) Neither 1 nor 2**

### 50) Answer: (b)

**Difficulty Level : Easy**

**Micro Topic : COMBINATIONS**

**Explanation:**

Let there be n number of people in the room.

For a single handshake 2 people are involved.

So, total number of handshakes =  ${}^n C_2$

Given,  ${}^n C_2 = 91$

$\Rightarrow n(n-1)/2 = 91$

$$\Rightarrow n^2 - n - 182 = 0$$

So n = 14

### 51) Answer: (c)

**Difficulty Level: Medium**

- **Option (a) is INCORRECT:** The passage does mention that "caste" can apply in both religious and secular contexts, and similar systems exist among various religious, ethnic, and geographical groups, including diaspora populations. However, this point is not the primary focus of the passage. The crux of the passage is more about the hierarchical nature and the discrimination inherent in the caste system, rather than just its extension beyond religious boundaries.
- **Option (b) is INCORRECT:** This is incorrect because the passage explains that while the caste system is historically linked to South Asia, it has since expanded in scope. It mentions that caste-like systems exist in different religious, ethnic, and geographical contexts, including among diaspora populations. Therefore, South Asia is not the only region affected.
- **Option (c) is CORRECT:** This is the best option because it directly captures the core idea of the passage. The passage describes caste as a "rigid, hierarchical social structure" and emphasizes that those at the bottom face "exclusion and discrimination across various aspects of life." This option highlights the discrimination aspect and the hierarchical nature, which is the central theme of the passage.



- **Option (d) is INCORRECT:** The passage does mention the historical context of the caste system's association with the four varnas, but it does not suggest that the varnas need to be reformed to restore relevance.

**52) Answer: (a)**

**Difficulty Level: Easy**

- **Option (a) is CORRECT:** The passage talks about how cultural differences between Eastern and Western societies are evident, affecting beliefs, thought patterns, and behaviours. The word "significant" in this option captures the emphasis on the noticeable and impactful cultural divides described in the passage.
- **Option (b) is INCORRECT:** While this option touches on a potential outcome of cultural differences (i.e., struggle to reach a consensus), the passage does not specifically address conflict or consensus between the cultures. The passage focuses more on the differences themselves rather than on whether these differences cause struggles in agreement.
- **Option (c) is INCORRECT:** This statement suggests that the differences between Eastern and Western cultures are so vast that they cannot be reconciled. The passage does not claim that the gap is unbridgeable, only that cultural differences exist.
- **Option (d) is INCORRECT:** This option brings up the idea of cultural preservation in the context of an "open society." However, the passage does not discuss cultural preservation or the challenges it may face in an open society.

**53) Answer: (b)**

**Difficulty Level: Easy**

- **Option (a) is INCORRECT:** While the passage briefly discusses the positive changes in financing after corporatization, it does not focus on the struggles of film producers in the 20th century. It emphasizes how corporatization has improved financing, rather than detailing the challenges faced prior to this change.
- **Option (b) is CORRECT:** The passage primarily discusses how corporatization has transformed the Indian film industry, bringing in institutional finance, improving corporate governance, increasing efficiency, and fostering international collaborations.
- **Option (c) is INCORRECT:** The passage does mention that international studios began collaborating with Indian production houses after the shift toward corporatization, but the primary focus of the passage is not solely on the timeline of international studios entering India.
- **Option (d) is INCORRECT:** This option is too narrow to represent the crux of the passage.

**54) Answer: (c)**

**Difficulty Level: Medium**

**Micro Topics: Probability**

We need to find the probability of drawing exactly 2 red balls and 1 blue ball when one ball is drawn randomly from each of the three bags.

The event we are considering consists of drawing:

- A red ball from Bag 1
- A red ball from Bag 2



- A blue ball from Bag 3
- or

- A red ball from Bag 1
- A blue ball from Bag 2
- A red ball from Bag 3

or

- A blue ball from Bag 1
- A red ball from Bag 2
- A red ball from Bag 3

- Bag 1: Probability of drawing a red ball =  $\frac{4}{6} = \frac{2}{3}$ , probability of drawing a blue ball =  $\frac{2}{6} = \frac{1}{3}$
- Bag 2: Probability of drawing a red ball =  $\frac{3}{6} = \frac{1}{2}$ , probability of drawing a blue ball =  $\frac{3}{6} = \frac{1}{2}$
- Bag 3: Probability of drawing a red ball =  $\frac{2}{6} = \frac{1}{3}$ , probability of drawing a blue ball =  $\frac{4}{6} = \frac{2}{3}$

Compute probability for each favourable case

1. Red from Bag 1, Red from Bag 2, Blue from Bag 3:

$$\frac{2}{3} \times \frac{1}{2} \times \frac{2}{3} = \frac{4}{18}$$

2. Red from Bag 1, Blue from Bag 2, Red from Bag 3:

$$\frac{2}{3} \times \frac{1}{2} \times \frac{1}{3} = \frac{2}{18}$$

3. Blue from Bag 1, Red from Bag 2, Red from Bag 3:

$$\frac{1}{3} \times \frac{1}{2} \times \frac{1}{3} = \frac{1}{18}$$

Sum of probabilities

$$\frac{4}{18} + \frac{2}{18} + \frac{1}{18} = \frac{7}{18}$$

$$\frac{7 \times 3}{18 \times 3} = \frac{21}{54} \text{ (to match the option)}$$

Therefore, the correct answer is option (c)

### 55) Answer: (d)

**Difficulty Level: Easy**

**Micro Topic: Averages**

**Statement-I:**

A company with four teams—Team A, Team B, Team C, and Team D—each comprising seven employees, has an average employee salary of ₹52,000 per month.

- This statement provides the overall average salary of all employees in the company (₹52,000) and the number of employees in each team (7 employees per team). However,



it does not provide any specific information about the original average salary of Team C before the increase. Therefore, Statement-I alone cannot answer the question.

**Statement-II:**

The salaries of employees in Team C increase by 10%, while the salaries in other teams remain unchanged.

- This statement provides information about the percentage increase in salaries for Team C but does not provide any numerical value for the original or new average salary of Team C. Therefore, Statement-II alone cannot answer the question.

**Using Both Statements Together:**

- From Statement-I, we know the overall average salary of all employees in the company is ₹52,000, and there are 4 teams with 7 employees each, making a total of 28 employees.
- From Statement-II, we know that the salaries of Team C increased by 10%, while the salaries of the other teams remained unchanged.

However, even with both statements, we do not have enough information to determine the original average salary of Team C. We would need additional information, such as the new average salary of Team C after the increase.

**Therefore, the Question cannot be answered even by using both Statements together.**

**56) Answer: (c)**

**Difficulty Level: Easy**

**Micro Topics: Averages**

**Find the total height of each class before the transfer**

Total Height of Class A =  $50 \times 140 = 7000\text{cm}$

Total Height of Class B =  $40 \times 155 = 6200\text{cm}$

**Let  $x$  be the number of students transferred**

Since the average height of Class A remains the same, this means that each transferred student must have the same average height as Class A (i.e., 140 cm).

Thus, the total height of the  $x$  transferred students from Class A =  $140x$

- After the transfer, the new total number of students in Class B =  $(40 + x)$
- The new total height of **Class B** after transfer:

$$6200 + 140x$$

- The new average height of **Class B** is **160 cm**, so:

$$\frac{6200 + 140x}{40 + x} = 152$$

**Solve for  $x$**

Multiply both sides by  $(40 + x)$ :

$$6200 + 140x = 152(40 + x)$$

$$6200 + 140x = 6080 + 152x$$

Rearrange:

$$6200 - 6080 = 160x - 152x$$

$$120 = 12x$$

$$x = \frac{120}{12} = 10$$

Thus, the number of students moved from **Class A to Class B** is **10**.



57) Answer: (b)

**Difficulty Level: Easy**

**Micro Topics: Speed Distance and Time**

- Let the speed of the faster train be  $x$  km/h.
- The slower train travels at  $x - 30$  km/h.
- Distance between the two stations = 240 km.
- The slower train takes 4 hours more than the faster train.

Using the time formula:

$$TIME = \frac{DISTANCE}{SPEED}$$

- Time taken by the faster train:

$$\frac{240}{x}$$

- Time taken by the slower train:

$$\frac{240}{x - 30}$$

Since the slower train takes 4 hours more, we set up the equation:

$$\frac{240}{x - 30} - \frac{240}{x} = 4$$

Solve for  $x$

$$\begin{aligned}240x - 240(x - 30) &= 4x(x - 30) \\240x - 240x + 7200 &= 4x^2 - 120x \\7200 &= 4x^2 - 120x \\4x^2 - 120x - 7200 &= 0 \\x^2 - 30x - 1800 &= 0\end{aligned}$$

Solve using the quadratic formula:

$$\begin{aligned}x &= \frac{(-30) \pm \sqrt{(-30)^2 - 4(1)(-1800)}}{2(1)} \\x &= \frac{30 \pm \sqrt{900 + 7200}}{2} \\x &= \frac{30 \pm \sqrt{8100}}{2} \\x &= \frac{30 \pm 90}{2}\end{aligned}$$

Possible values for  $x$ :

$$x = \frac{30 + 90}{2} = \frac{120}{2} = 60$$

$$x = \frac{30 - 90}{2} = \frac{-60}{2} = -30 \text{ (Not possible, as speed cannot be negative)}$$

Therefore, the speed of the faster train is 60 km/h (Option b).

**#Note: The above question can also be solved using the options:**

**Let us check Option (b): 60 km/h**

- Speed of the faster train = 60 km/h
- Speed of the slower train =  $60 - 30 = 30$  km/h
- Time taken by the faster train =  $\frac{240}{60} = 4$  hours
- Time taken by the slower train =  $\frac{240}{30} = 8$  hours
- Difference =  $8 - 4 = 4$  hours (Correct)



58) Answer: (b)

Difficulty Level: Easy

Micro Topic: Speed, Distance, Time, Train

Given Data

- Average speed of the train = 75.6 km/h
  - Converting to meters per second:

$$75.6 \times \frac{5}{18} = 21 \text{ m/s}$$

**Statement-I**

- The train crosses a pole in 7 seconds.
- Since crossing a pole means covering its own length, we use the formula:

$$\text{Length of Train} = \text{Speed} \times \text{Time}$$

$$\text{Length of Train} = 21 \times 7 = 147 \text{ m}$$

Thus, we can determine the length of the train using this statement alone.

**Statement-II**

- The train crosses a 378-meter-long platform in 25 seconds.
- The total distance covered in this case is (Train Length + 378 meters).
- Using the formula:

$$(\text{Length of Train} + 378) = \text{Speed} \times \text{Time}$$

$$(\text{Length of Train} + 378) = 21 \times 25$$

$$(\text{Length of Train} + 378) = 525$$

$$(\text{Length of Train}) = 525 - 378 = 147 \text{ m}$$

- Therefore, we can determine the length of the train using this statement alone as well.

**Conclusion**

- Statement-I alone is sufficient to determine the length of the train.
- Statement-II alone is also sufficient to determine the length of the train.

Thus, the correct answer is: **(b) The question can be answered by using either statement alone.**

59) Answer: (c)

Difficulty Level: Easy

Micro Topic: Geometric Progression

Finding the Areas of the Squares

- First square (original tile)

$$A_1 = 8^2 = 64 \text{ m}^2$$

- Second square (formed by joining midpoints)

Each new square has its side length reduced by a factor of  $\frac{1}{\sqrt{2}}$

$$\text{New side} = \frac{8}{\sqrt{2}} = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$$

$$A_2 = (4\sqrt{2})^2 = 32 \text{ m}^2$$

- Third square

$$\text{New side} = \frac{4\sqrt{2}}{\sqrt{2}} = 4$$

$$A_3 = 4^2 = 16 \text{ m}^2$$



- Fourth square

$$\text{New side} = \frac{4}{\sqrt{2}} = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$$

$$A_4 = (2\sqrt{2})^2 = 8m^2$$

- This pattern continues, forming an infinite geometric series with:
  - First term  $a = 64$
  - Common ratio  $r = \frac{1}{2}$

Finding the Total Sum:

The sum of an infinite geometric series is given by the formula:

$$s = \frac{a}{1-r}$$

Substituting the values:

$$s = \frac{64}{1 - \frac{1}{2}} = \frac{64}{\frac{1}{2}} = 128$$

**Thus, the total sum of the areas of all the square tiles is 128 m<sup>2</sup>.**

**60) Answer: (a)**

**Difficulty Level: Easy**

**Micro topics: Cubes and Cuboids**

We are given 216 identical cubes arranged in the form of a cubical block and need to determine how many cubes are completely surrounded by other cubes from each side (i.e., not visible from any face).

- Since  $216 = 6^3$ , the large cube has dimensions  $6 \times 6 \times 6$ .
- To count the number of cubes that are completely surrounded, we remove the outermost layer from all sides.
- The inner cube that remains after removing one layer from each face has a dimension of:  $(6 - 2)^3 = 4^3 = 64$

Therefore, the correct answer is option (a) 64

**61) Answer: (a)**

**Difficulty Level: Medium**

- **Option (a) is CORRECT:** The passage highlights the proactive efforts of the Indian Constitution framers and subsequent governments to ensure social justice, including constitutional amendments and policy reforms for financial inclusion and safeguarding marginalized communities.
- **Option (b) is INCORRECT:** This option introduces the idea of India's diversity and presents social justice as "unattainable," which is not stated or implied in the passage. While the passage recognizes challenges, it focuses on progressive efforts rather than suggesting that social justice is unachievable.



- **Option (c) is INCORRECT:** The passage does not discuss the definition of social justice or imply that changes in its definition make it impossible to achieve. Instead, it focuses on efforts and measures taken to achieve social justice.
- **Option (d) is INCORRECT:** This option directly contradicts the passage. The passage highlights the proactive role of governments in introducing policy reforms and constitutional amendments, indicating political will rather than a lack of it.

**62) Answer: (a)**

**Difficulty Level: Easy**

- **Option (a) is CORRECT:** This option captures the essence of the passage, which emphasizes how privacy is a subjective and multifaceted concept influenced by the diverse cultural, religious, and societal values of India.
- **Option (b) is INCORRECT:** While the passage acknowledges the diversity in the understanding of privacy, it does not emphasize the need for legal enforcement as a primary focus. The crux is more about how privacy is shaped by diverse cultural and individual perspectives rather than calling for uniform legal frameworks.
- **Option (c) is INCORRECT:** The passage does not mention this.
- **Option (d) is INCORRECT:** The passage does not make any comparisons with Western nations or suggest that India should adopt their methods. The focus is entirely on India's internal diversity and how it shapes the notion of privacy, without referencing external systems or solutions.

**63) Answer: (b)**

**Difficulty Level: Easy**

- **Assumption 1 is INCORRECT:** This assumption is not valid. The passage suggests the integration of informal sector workers into the formal economy is crucial, but it does not imply that this transition is easy.
- **Assumption 2 is CORRECT:** The passage highlights the diverse components of the Indian economy—such as the formal and informal sectors, rural and urban settings, agricultural and non-agricultural activities, and skilled and unskilled labour. This diversity and complexity make managing economic issues challenging, as addressing the needs of each group requires tailored approaches.
- **Assumption 3 is INCORRECT:** The passage does not explicitly claim that non-agricultural employment creates greater value than agricultural work. It mentions that non-agricultural activities like small-scale manufacturing and services contribute significantly to rural household incomes, but it does not directly compare the value of these activities with agricultural work.

**64) Answer: (a)**

**Difficulty Level: Easy**

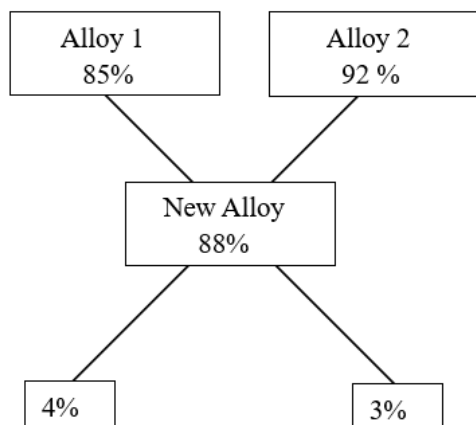
**Micro Topics: Mixtures and Percentages**

We have two types of gold alloys:

- Alloy 1: 85% gold
- Alloy 2: 92% gold

We need to mix these two alloys to obtain 70 kg of a new alloy containing 88% gold.

Using the allegation method:



So, the ratio of Alloy 1 to Alloy 2 is 4:3.

The total ratio parts =  $4 + 3 = 7$

• Quantity of Alloy 1:

$$\text{Quantity of Alloy 1} = \frac{4}{7} \times 70 = 40 \text{ kg}$$

• Quantity of Alloy 2:

$$\text{Quantity of Alloy 2} = \frac{3}{7} \times 70 = 30 \text{ kg}$$

Therefore, to get 70 kg of 88% gold alloy, mix 40 kg of 85% alloy and 30 kg of 92% alloy in a 4:3 ratio.

### 65) Answer: (b)

**Difficulty Level: Easy**

**Micro topics: Ratio and Proportion**

Let:

- $x$  = number of 10 paise coins
- $y$  = number of 25 paise coins
- $z$  = number of 50 paise coins

We are given:

1. **Total number of coins:**

$$x + y + z = 700 \rightarrow (\text{Equation 1})$$

**Total value of coins is ₹210:**

Since ₹1 = 100 paise, the total value in paise is:

$$10x + 25y + 50z = 210 \times 100 = 21000 \rightarrow (\text{Equation 2})$$

2. **Relationship between 25 paise and 50 paise coins:**

The number of 25 paise coins is double the number of 50 paise coins:

$$y = 2z \rightarrow (\text{Equation 3})$$

From Equation 3,  $y = 2z$ . Substitute this into Equations 1 and 2:

**Equation 1:**

$$x + y + z = 700$$

$$x + 2z + z = 700$$

$$x + 3z = 700$$

$$x = 700 - 3z \rightarrow (\text{Equation 4})$$

**Equation 2:**

$$x + 25y + 50z = 21000$$



Substitute  $y = 2z$ :

$$\begin{aligned}10x + 25(2z) + 50z &= 21000 \\10x + 50z + 50z &= 21000 \\10x + 100z &= 21000 \\x + 10z &= 2100 \rightarrow (\text{Equation 5})\end{aligned}$$

From Equation 4,  $x = 700 - 3z$ . Substitute this into Equation 5:

$$\begin{aligned}x + 10z &= 2100 \\(700 - 3z) + 10z &= 2100 \\700 - 3z + 10z &= 2100 \\700 + 7z &= 2100 \\7z &= 1400 \\z &= 200\end{aligned}$$

**Find  $y$  and  $x$**

From Equation 3 ( $y = 2z$ ):

$$y = 2 \times 200 = 400$$

From Equation 4 ( $x = 700 - 3z$ ):

$$x = 700 - 3 \times 200 = 700 - 600 = 100$$

**Verify the Statements**

Now, let's check the given statements:

1. **The number of 10 paise coins is 250.**

We found  $x=100$ , so this statement is **incorrect**.

2. **The number of 50 paise coins is 200.**

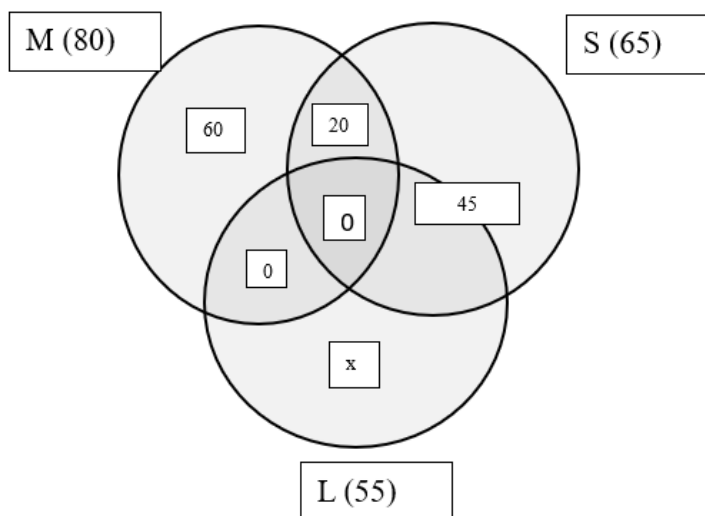
We found  $z=200$ , so this statement is **correct**.

**Therefore, the Final Answer is:** Only statement 2 is correct. **(b) 2 only**

**66) Answer: (a)**

**Difficulty Level: Medium**

**Micro Topic: Set Theory**





The total number of people is the sum of all regions in the Venn diagram:

$$\text{Total number of people} = 60 + 20 + 45 + x = 125 + x$$

So, the total number of people depends on  $x$  (only Literature).

**Statement 1: 55 people attended the Literature session.**

We cannot determine  $x$  uniquely from this statement. **Hence, Statement 1 alone is not sufficient.**

**Statement 2: The total number of attendees at the seminar is six times the number of people who attended only Literature.**

This means:

$$\text{Total} = 6x$$

From the total equation:

$$125 + x = 6x$$

$$125 = 5x$$

$$x = \frac{125}{5} = 25$$

**Statement 2 alone is sufficient.**

Thus, the correct answer is:

**(a) The Question can be answered by using one of the Statements alone, but cannot be answered using the other Statement alone.**

**67) Answer: (c)**

**Difficulty Level: Medium-Difficult**

**Micro Topics: Profit and Loss**

**Given:**

- Total books = **50**
- Selling price per book at full sale = **₹200**
- For every **₹10** increase in price, **one additional book remains unsold.**

Let  $x$  be the number of **unsold books**.

Then, the **number of books sold** =  $(50 - x)$

And the **selling price per book** =  $(200 + 10x)$

**Write the Total Revenue Equation**

$$\text{Total Revenue} = (\text{Number of books sold}) \times (\text{Selling price per book})$$

$$y = (50 - x)(200 + 10x)$$

$$y = 50 \times 200 + 50 \times 10x - x \times 200 - x \times 10x$$

$$y = 10000 + 300x - 10x^2$$

For a quadratic equation of the form:

$$R = ax^2 + bx + c$$

The maximum occurs at:

$$x = \frac{-b}{a}$$

For our equation:

- $a = -10$
- $b = 300$

$$x = \frac{-300}{2(-10)}$$



$$x = \frac{300}{20} = 15$$

$$\begin{aligned} \text{Selling price per book} &= 200 + 10(15) \\ &= 200 + 150 = 350 \end{aligned}$$

Therefore, the selling price for maximum profit is **₹350**.

**68) Answer: (b)**

**Difficulty Level: Easy**

**Micro Topic: Simple interest**

Let Rahul borrow **Rs.  $x$**  at **10% per annum** and the remaining at **15% per annum**.

**Calculate Interest for Each Loan**

- Interest from the loan at **10% per annum**

$$10/100 \times x = 0.10x$$

- Interest from the loan at **15% per annum:**

$$\frac{15}{100} \times (2000 - x) = 0.15(2000 - x)$$

Total interest paid for the year is **Rs. 240**, so:

$$0.10x + 0.15(2000 - x) = 240$$

Expanding the equation:

$$0.10x + 300 - 0.15x = 240$$

$$0.05x = 60$$

$$x = \frac{60}{0.05} = 1200$$

Therefore, Ravi borrows **Rs. 1200** at **10% per annum**.

**69) Answer: (a)**

**Micro Topic: Logical Problems**

**Difficulty Level: Medium**

**Statement I:**  $T \times U^2 = 196$

$$T \times U^2 = 196$$

$$T \times U^2 = 2^2 \times 7^2$$

Now, since T and U are digits from 0 to 9,

$$T = 4$$

$$U = 7$$

**Thus, Statement I ALONE is sufficient.**

**Statement-II:**  $3T + 5U = 47$

$$U = (47 - 3T)/5.$$

When  $T=4$ , we get  $U = 7$  and  $TU = 47$ .

When  $T=9$ , we get  $U=4$  and  $TU = 94$

Since multiple solutions are possible, **Statement II ALONE is not sufficient.**

**70) Answer: (c)**

**Difficulty Level: Easy**

**Micro Topics: Partnerships**

To find **C's share of the profit**, we need to calculate the **profit-sharing ratio** based on the capital invested and the time period each partner was involved.



- **A invests Rs. 80,000 for 12 months** →  $80,000 \times 12 = 9,60,000$
- **B invests Rs. 1,20,000 for 8 months** →  $1,20,000 \times 8 = 9,60,000$
- **C invests Rs. 1,60,000 for 4 months** →  $1,60,000 \times 4 = 6,40,000$

#### Profit-Sharing Ratio

$$A : B : C = 9,60,000 : 9,60,000 : 6,40,000 \\ = 12 : 12 : 8 = 3 : 3 : 2$$

So, the profit should be shared in the **ratio** 3 : 3 : 2

#### Finding C's Share of the Profit

Total **profit** = **Rs. 52,000**

Total parts in the ratio = **3+3+2 = 8**

Each part of the profit =

$$\frac{52000}{8} = 6500$$

C's share = **2 parts**

$$2 \times 6500 = 13000$$

Therefore, the correct answer is **(c) Rs. 13,000**.

#### 71) Answer: (c)

##### Difficulty Level: Hard

- **Option (a) is INCORRECT:** This statement is not supported by the passage. The passage does not focus on the passion of individuals who separate their arguments from emotions. Instead, it describes how emotions make beliefs harder to challenge or change.
- **Option (b) is INCORRECT:** The passage does not suggest that combining emotion and logic can be the ideal approach. Instead, it contrasts beliefs based on logic (which can be changed with reasoning) with beliefs based on emotion (which are more resistant to change).
- **Option (c) is CORRECT:** This is because the passage discusses how beliefs based on reasoning can be altered when refuted, while those based purely on feeling tend to generate new defenses and are more resistant to challenge, even when logical arguments are presented.
- **Option (d) is INCORRECT:** The passage suggests that emotional beliefs are difficult to change, but it does not focus on how emotional arguers fail to change the minds of others. Instead, it emphasizes that emotional beliefs self-reinforce when challenged, even against logical arguments.

#### 72) Answer: (a)

##### Difficulty Level: Easy

- **Assumption 1 is CORRECT:** see the statements "The development of a nation is closely tied to its people's understanding and application of science and technology". "Therefore, it is crucial for a substantial portion of citizens in every developing country to grasp and pursue the principles of modern science and the technology derived from it." Though the passage doesn't explicitly comment on the world's leadership, the key words 'assumption' in the question and 'can' in the statement substantiate the answer.



- **Assumption 2 is CORRECT:** “see the statements “The development of a nation is closely tied to its people's understanding and application of science and technology”. “Therefore, it is crucial for a substantial portion of citizens in every developing country to grasp and pursue the principles of modern science and the technology derived from it.” Though the passage doesn’t explicitly comment on the world’s leadership, the key words ‘assumption’ in the question and ‘can’ in the statement substantiate the answer.
- **Assumption 3 is INCORRECT:** The passage does not mention this.

**73) Answer: (c)**

**Difficulty Level:** Medium

**Micro Topics:** Mensuration, Cube, Surface Area

**Step 1: Finding the Total Number of Smaller Cubes**

- The original cube has a side length of 6 cm.
- It is cut into smaller cubes with a side length of 2 cm.
- The number of cubes along each side =  $\frac{6}{2} = 3$ .
- The total number of smaller cubes =  $3 \times 3 \times 3 = 27$ .

**So, Statement 1 is correct.**

**Step 2: Comparing the Surface Areas**

- Surface Area of the Original Cube
  - Formula:  $6 \times side^2$
  - $6 \times 6^2 = 6 \times 36 = 216cm^2$
- Surface Area of Each Smaller Cube
  - Side of each small cube = 2 cm
  - Surface area of one small cube =  $6 \times 2^2 = 6 \times 4 = 24cm^2$ .
- Total Surface Area of All 27 Small Cubes
  - $27 \times 24 = 648cm^2$

Since  $648 \text{ cm}^2$  is greater than  $216 \text{ cm}^2$ , the total surface area of all the smaller cubes is greater than that of the original cube.

**So, Statement 2 is also correct.**

**Since both statements are correct, the correct option is:(c) Both 1 and 2.**

**74) Answer: (a)**

**Difficulty Level:** Easy

**Micro Topics:** Logical – Reasoning

The rule is:

1. Add all the given numbers.
2. Find the sum of the digits of that sum.
3. Take half of the sum of the digits.

**Checking the given examples:**

**1. 6 # 9 # 13 = 5**

- Sum of numbers:  $6 + 9 + 13 = 28$
- Sum of digits:  $2 + 8 = 10$
- Half of 10:  $10 / 2 = 5$

**2. 8 # 11 # 21 = 2**



- Sum of numbers:  $8 + 11 + 21 = 40$
- Sum of digits:  $4 + 0 = 4$
- Half of 4:  $4 / 2 = 2$

**3. 11 # 14 # 28 = 4**

- Sum of numbers:  $11 + 14 + 28 = 53$
- Sum of digits:  $5 + 3 = 8$
- Half of 8:  $8 / 2 = 4$

**Now, solving for 13 # 17 # 36:**

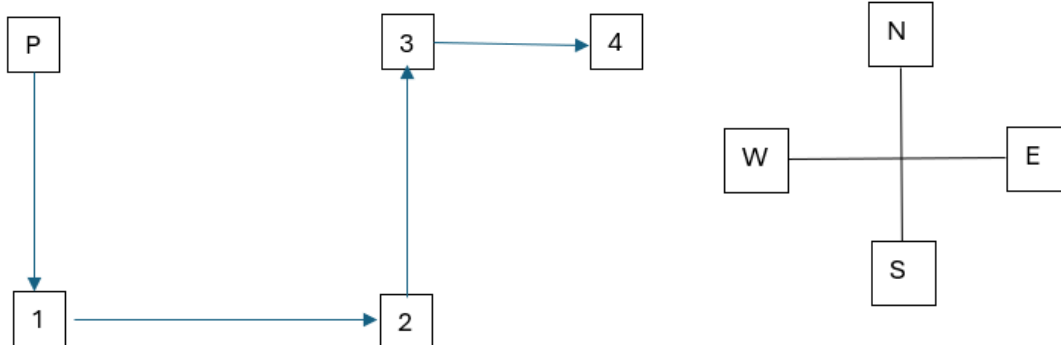
- Sum of numbers:  $13 + 17 + 36 = 66$
- Sum of digits:  $6 + 6 = 12$
- Half of 12:  $12 / 2 = 6$

**Thus, the correct answer is (a) 6**

**75) Answer: (d)**

**Difficulty Level: Easy**

**Micro Topics: Directions**



Let's analyse the movements step by step:

1. The person moves 5 km south from point P.
  2. Then, they turn left (towards the east) and move 7 km.
  3. They turn left again (towards the north) and move 5 km.
    - At this point, they are aligned with P but 7 km to the east.
  4. Finally, they turn right (towards the east) and move 4 km.
- Now, the person is  $(7 + 4) = 11$  km to the east of point P.

**76) Answer: (b)**

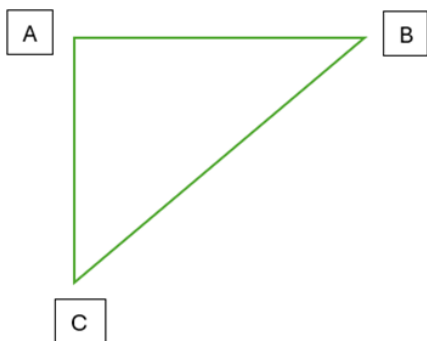
**Difficulty Level: Easy**

**Micro Topics: Directions, Pythagoras theorem**

This question involves applying the Pythagorean theorem because the towns A, B, and C form a right-angled triangle with A as the common point.

**Given:**

- Distance between A and B = 50 km (east direction)
- Distance between A and C = 120 km (south direction)
- We need to find the distance between B and C



Since A, B, and C form a right-angled triangle with A as the right-angle, we use the Pythagorean theorem:

$$\begin{aligned}BC^2 &= AB^2 + AC^2 \\BC^2 &= 50^2 + 120^2 \\BC^2 &= 2500 + 14400 \\BC^2 &= 16900 \\BC &= \sqrt{16900} = 130\end{aligned}$$

**Therefore, the correct answer is (b) 130 km**

**77) Answer: (b)**

**Difficulty Level: Medium**

**Micro Topics: Sequence and Series**

**Sequence:**

2, 12, 36, 80, 150, \*, 392

The given pattern follows:

$$(n + n^2) \times n$$

for each term.

1. For 1st term ( $n = 1$ ):

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

2. For 2nd term ( $n = 2$ ):

$$(2 + 2^2) \times 2 = (2 + 4) \times 2 = 12$$

3. For 3rd term ( $n = 3$ ):

$$(3 + 3^2) \times 3 = (3 + 9) \times 3 = 36$$

4. For 4th term ( $n = 4$ ):

$$(4 + 4^2) \times 4 = (4 + 16) \times 4 = 80$$

5. For 5th term ( $n = 5$ ):

$$(5 + 5^2) \times 5 = (5 + 25) \times 5 = 150$$

6. \*For 6th term ( $n = 6$ ) (Missing):

$$(6 + 6^2) \times 6 = (6 + 36) \times 6 = 252$$

7. For 7th term ( $n = 7$ ):

$$(7 + 7^2) \times 7 = (7 + 49) \times 7 = 392$$



**Final Answer: The missing term is 252**

**78) Answer: (d)**

**Difficulty Level: Medium-Difficult**

**Micro Topics: Sequence and Series**

A, A, B, B, B, C, C, C, C, D, D, D, D, D, ..., Z

Identify the pattern

1. A appears 2 times.
2. B appears 3 times.
3. C appears 4 times.
4. D appears 5 times.
5. The pattern continues, with each letter appearing one more time than the previous letter.

So, for the letter N, it will appear  $(N + 1)$  times.

Find the total number of terms

The total number of terms in the sequence is the sum of the first 26 natural numbers starting from 2:

$$S_n = 2 + 3 + 4 + \dots + 27$$

This follows the sum formula for an arithmetic series:

$$s_n = \frac{n(n+1)}{2} - 1$$

where  $n = 27$ :

$$s_{27} = \frac{27 \times 28}{2} - 1 = 377$$

The total number of terms in the sequence is 377.

Find the middle term:

Since the total sequence has 377 terms, the middle term is at position:

$$\frac{377 + 1}{2} = 189$$

Now, let's find which letter corresponds to the 189th term.

Locate the middle position

We sum the occurrences of each letter until we reach 189:

- A: 2
- B:  $2 + 3 = 5$
- C:  $5 + 4 = 9$
- D:  $9 + 5 = 14$
- E:  $14 + 6 = 20$
- F:  $20 + 7 = 27$
- G:  $27 + 8 = 35$
- H:  $35 + 9 = 44$
- I:  $44 + 10 = 54$
- J:  $54 + 11 = 65$
- K:  $65 + 12 = 77$



- L:  $77 + 13 = 90$
- M:  $90 + 14 = 104$
- N:  $104 + 15 = 119$
- O:  $119 + 16 = 135$
- P:  $135 + 17 = 152$
- Q:  $152 + 18 = 170$
- R:  $170 + 19 = 189$

The 189th term falls within R, making the middle term R.

**79) Answer: (c)**

**Difficulty Level: Medium**

**Micro Topics: Ages**

1. Define Variables:

- Let  $B$  be the current age of the brother.
- Let  $S$  be the current age of the sister.
- Let  $D$  be the age difference between the brother and sister. Since the brother is older,  $D=B-S$ .

2. First Statement:

- "When I was your age, you were 8 years old."
- This means that when the brother was  $S$  years old (which is  $D$  years ago), the sister was 8 years old.
- So,  $S-D=8$ .

3. Second Statement:

- "When you reach my current age, I will be 50."
- This means that when the sister reaches  $B$  years old (which will be in  $D$  years), the brother will be 50 years old.
- So,  $B+D=50$ .

4. Set Up the Equations:

- From the first statement:  $S-D=8 \rightarrow$  Equation (1)
- From the second statement:  $B+D=50 \rightarrow$  Equation (2)
- Also, since  $D=B-S$ , we can substitute  $B=S+D$  into Equation (2).

5. Solve the Equations:

- Substitute  $B=S+D$  into Equation (2):

$$(S + D) + D = 50$$
$$S + 2D = 50(\text{Equation 3})$$

- From Equation (1):  $S=D+8$ .
- Substitute  $S=D+8$  into Equation (3):

$$(D + 8) + 2D = 50$$
$$3D + 8 = 50$$
$$3D = 42$$
$$D = 14$$

Therefore, the age difference  $D$  between the brother and sister is 14 years.



**80) Answer: (b)**

**Difficulty Level: Easy**

**Micro Topics: Clocks and Calendar**

To determine the angle between the hour and minute hands at 7:20, we use the formula:

$$\theta = |(30H - 5.5M)|$$

Where:

- H = Hour
- M = Minutes
- 30H calculates the hour hand's position (since each hour corresponds to 30°).
- 5.5M calculates the movement of the hour hand due to the minutes passed.

Step 1: Calculate the Hour Hand's Position

- The hour hand moves 30° per hour.
- At 7:00, the hour hand is at:

$$7 \times 30^\circ = 210^\circ$$

- In 20 minutes, the hour hand moves further:

$$20 \times \frac{30}{60} = 10^\circ$$

- So, the hour hand's position at 7:20 is:

$$210 + 10 = 220^\circ$$

Step 2: Calculate the Minute Hand's Position

- The minute hand moves 6° per minute (since  $360^\circ \div 60 = 6^\circ$ ).
- At 20 minutes, the minute hand is at:

$$20 \times 6 = 120^\circ$$

Step 3: Find the Angle Between the Hands

$$\theta = |220 - 120| = 100$$

Therefore, the Correct answer is: (b) 100°