

## ANSWERS & EXPLANATION

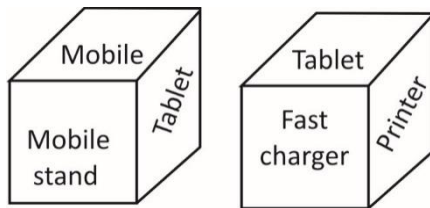
### APTITUDE TEST–Test (4298) – 2024

1 (d)

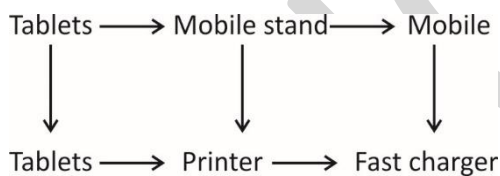
Given,  $Q$  is an odd natural number.  
 $\therefore 41^Q + 7^Q$  must be divisible by  $(41 + 7)$ , i.e. 48.  
 $\therefore$  It will be divisible by any factor of 48.  
Among the given options, only 36 is not a factor of 48.  
Hence, option (d) is the right answer.

2 (a)

Given positions of the cube:



From above we get,



Hence, Mobile stand is opposite to the Printer.  
Hence, option (a) is the right answer.

3 (c)

**Assumption 1 is correct:** Refer to the line: “Patients must have control over how their health data is used and shared.” Clearly, there are privacy concerns with the increasing use of AI in healthcare. So, innovations in AI need to be balanced with addressing these concerns for the effective use of AI in healthcare. So, this assumption is correct as per the passage.

**Assumption 2 is correct:** The passage is about privacy concerns with the increasing use of AI in healthcare and highlights the need for regulations. It is evident from the line: “Regulatory frameworks with penalty provisions must evolve to address the unique challenges posed by AI in healthcare.” The government is responsible for regulations through laws and policies. So, this assumption that the government needs to form laws and policies for privacy threats is correct.

4 (c)

**Option (a) is incorrect:** The passage is about AI in health and the associated privacy concerns. However, this option misses the context of privacy concerns. So, this option is not the best crux of the passage.

**Option (b) is incorrect:** As per this answer option a robust transparency framework and strict privacy standards will foster innovation in AI health. However, the passage does not mention them as precursors for innovation in AI health. The passage only mentions that privacy and transparency foster trust in AI healthcare solutions. So, this is not the best crux of the passage.

**Option (c) is correct:** The passage is about AI in health and the privacy challenges associated with it. The lines, “*Patients must have control over how their health data is used and shared. Robust cybersecurity measures are essential to prevent unauthorized access and protect against potential breaches. AI algorithms often rely on vast datasets, including sensitive health information, to train and improve their performance*”, show that without privacy, AI in healthcare can be misused. Hence, it is correct to state that without privacy safeguards AI in healthcare could be dangerous due to the threat of misuse of data.

5 (a)

**Inference 1 is correct:** The passage clearly shows that the institution of marriage has transitioned from the traditional form to the modern construct as seen in the lines “*The rise in inter-cultural and inter-faith marriages, as well as an increase in instances of late or chosen marriages, indicates a departure from conventional views*”. Also, the line “*...the traditional perception of marriage as a sacrament is transforming...*” clearly shows the changing notion. So, it would be correct to infer that the value of marriage as a sacrament is subjective.

**Inference 2 is incorrect:** The context of the Western constructs has nowhere been discussed, and how they impact the institution of marriage is also not covered. So, this option is beyond the scope of the passage and is not correct.

6 (d)

**Option (a) is incorrect:** The transition of marriage from a traditional to a modern construct is a phenomenon driven by changing social milieu. There is no information in the passage which can prove that it reflects the loss of culture and values in the society. It just represents the changing values and culture.

**Option (b) is incorrect:** The context of reversal of transformations in the institution of marriage is not reflected in the passage directly or indirectly. The author nowhere indicates a disappointment with these changes. So, there is no question about reversing them.

**Option (c) is incorrect:** The option seems to be correct, but it is not because of the aspect of redefined gender roles. Refer to the line: “*Economic independence and educational empowerment, particularly for women, have contributed to this paradigm shift.*” These developments may redefine gender roles, but saying that they are the ‘only’ factors driving the change in marriages would not be correct. There could also be other cultural shifts responsible for these changes.

**Option (d) is correct:** The passage is about the changing nature of the institution of marriage due to changes in society driven by evolving choices and changes in social environment. This is seen in the lines “*The once deeply ingrained societal norms surrounding matrimony are encountering challenges as individuals increasingly prioritize personal autonomy and career aspirations. The rise in inter-cultural and inter-faith marriages, as well as an increase in instances of late or chosen marriages, indicates a departure from conventional views.*” These lines clearly show that societal changes impact the institution of marriage. So, this is most definitively implied by the passage.

7 (a)

**Assumption 1 is correct:** The passage is about uncertainty in the context of decision-making, and its consequences. This assumption refers to the uncertainty that could result from choices which eventually could cause failure or a pause in growth as per the lines, “*The fear of making the wrong decision immobilizes any person, fostering a state of inertia that hinders personal growth and achievement. This perpetual hesitancy extends beyond the immediate choices; it corrodes his confidence and self-esteem, creating a cycle of self-doubt.*” So, this assumption is valid as per the passage.

**Assumption 2 is incorrect:** The passage covers the issues of uncertainty in decision-making. However, the given assumption mentions what kind of person makes decisive decisions in life which is not a part of the passage. For success, decisive approach might be needed. But to assume that a goal-oriented person is decisive would not be correct, as it is not based on the information contained in the passage. That would be an extreme extrapolation of the propositions made in the passage.

8 (c)

Y is thrice as fast as X. So it will take one-third the time of X to produce 1 lakh units.

Time taken by X to produce 1 lakh units = 30 h.

So, time taken by Y to produce 1 lakh units =  $30/3$  h = 10 h.

Since machine Z takes the same amount of time as machines X and Y running together.

So, if Z takes 'p' hours to produce 1 lakh units, then,

$$1/p = 1/30 + 1/10 \dots\dots\dots I$$

(1 hour work of each of X, Y and Z considered)

If 't' be the time taken to produce 1 lakh units when all the three machines are used simultaneously, then,

$$1/t = 1/30 + 1/10 + 1/p$$

(1 hour work of each of X, Y and Z considered)

$$\Rightarrow 1/t = 1/30 + 1/10 + 1/30 + 1/10 \quad (\text{from I})$$

$$\Rightarrow 1/t = 2(1/30 + 1/10)$$

$$\Rightarrow t = 3.75 \text{ h.}$$

Hence, option (c) is the correct answer.

9 (d)

Using either of the statement alone, we cannot find the ratio of profit as the data about sales and expenditures are given in different statements.

Combining both the statements, we get:

Let 4a and 5a be the sales and 3b and 4b be the expenditures of A and B respectively.

$$\therefore \text{Ratio of profits} = (4a - 3b)/(5a - 4b)$$

$$= [(5a - 4b) - (a - b)]/(5a - 4b)$$

$$= 1 - [(a - b)/(5a - 4b)]$$

$(a - b)/(5a - 4b)$  may or may not be positive, depending on whether  $a > b$  or  $a < b$ .

So, the ratio of profits may or may not be greater than 1 and hence, which company got a higher profit **cannot** be determined even using both the statements together.

Hence, option (d) is the correct answer.

10 (a)

Number of hours taken by Sachita to finish the work =  $48 \times 9 = 432$  hours

Number of hours taken by Shikha to finish the work =  $36 \times 16 = 576$  hours

Together they will do,  $(432 + 576)/(432 \times 576) = (7/1728)^{\text{th}}$  work in 1 hour

Hence, they will take  $1728/7$  hours to finish the work.

Therefore, working  $7(5/7)$  i.e.  $(54/7)$  hours a day, they can complete the work in  $(1728/7) \times (7/54) = 32$  days.

Hence, option (a) is the correct answer.

11 (c)

Let d be the distance between Pratapgarh and Prayagraj.

Then time taken by them to meet =  $d/[(d/42) + (d/56)] = (42 \times 56)/(42 + 56) = 24$  minutes

Since they started at 7:30 am, they would meet at 7:54 am.

Hence, option (c) is the correct answer.

12 (d)

Actual gain of Raghu = (Amount repaid by Kunal) - (Amount repaid by Raghu)

$$= 36000 [1 + (20/100)]^2 - 36000 [1 + (2 \times 10/100)]$$

$$= 36000 (1.44 - 1.2)$$

$$= \text{Rs. } 8640$$

Had Kunal repaid at the end of three years, the gain for Raghu would have been

$$= 36000 [1 + (20/100)]^3 - 36000 [1 + (3 \times 10/100)]$$

$$= 36000 (1.728 - 1.3)$$

$$= \text{Rs. } 15408$$

Extra gain for Raghu =  $15408 - 8640 = \text{Rs. } 6768$

Hence, option (d) is the correct answer.

13 (b)

Note: The question is about invalid assumptions.

**Assumption 1 is correct:** The line “*Effective utilization of digital tools requires not only access but also the ability to navigate and leverage them*” clearly shows that there is a lack of digital literacy in the country. Hence, it remains a challenge. So, this assumption is correct.

**Assumption 2 is incorrect:** It is incorrect to say that the Digital India initiative is not successful because of the lines “*The Digital India initiative has made significant strides in enhancing digital infrastructure, promoting e-governance, and fostering technology adoption, there are critical aspects that warrant analysis. One aspect is the digital divide, which persists across urban-rural and socio-economic lines.*” These lines show that though there are challenges, there are positive results as well.

14 (d)

**Assumption 1 is correct.** The given assumption is correct as it is based on the following line “*Gradually, educational approaches have turned more to skill development and addressing all health aspects, including physical, social, emotional, and mental well-being. ... It can also produce informed citizens who can seek services and advocate for policies and environments that affect their health.*” So, health education can enhance citizen participation in healthcare governance. Therefore, this answer option is correct.

**Assumption 2 is correct.** The lines “*Educating children and adolescents can instil positive health behaviours in the early years and prevent risk and premature death*” and “*Education for health is an important and essential component of an effective school health programme, and it is likely to be the most effective*”, show that health education in school should be prioritized. Hence, the given assumption is correct as per the passage.

15 (a)

We need to check all the options to see which of the codes follow the given rule.

Option (a):  $M + 2 \rightarrow P + 2 \rightarrow S + 2 \rightarrow V + 2 \rightarrow Y + 2 \rightarrow B + 2 \rightarrow E$  (follows the rule)

Option (b):  $Q + 2 \rightarrow T$  (does not follow the rule)

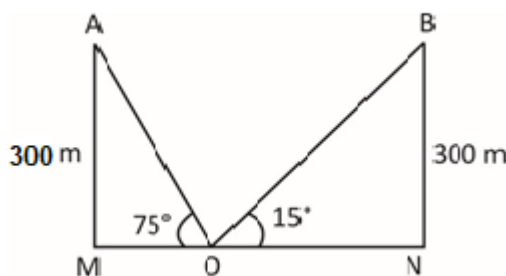
Option (c):  $E + 2 \rightarrow H$  (does not follow the rule)

Option (d):  $Z + 2 \rightarrow C + 2 \rightarrow F$  (does not follow the rule)

Hence, option (a) is the correct answer.

16 (d)

The figure:



Distance between the tops of the two buildings,  $AB = MN = OM + ON$

$$= 300(\cot 75^\circ + \cot 15^\circ)$$

$$= 300(\tan 15^\circ + \tan 75^\circ) \quad [\text{Since, } \tan 15^\circ = \cot (90 - 15)^\circ, \tan 75^\circ = \cot (90 - 75)^\circ]$$

$$= 300[(2 - \sqrt{3}) + (2 + \sqrt{3})]$$

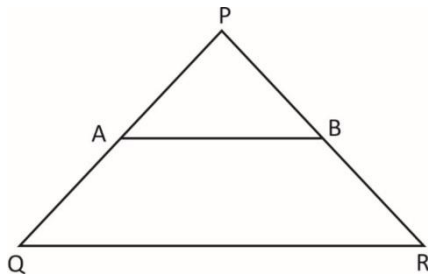
$$= 300 \times 4$$

$$= 1200 \text{ m}$$

Thus, the distance between the tops of the two buildings is 1200 m.

Hence, option (d) is the correct answer.

17 (b)



In triangles PAB and PQR,  
 $\angle PAB = \angle PQR$  (corresponding angles) and  
 $\angle PBA = \angle PRQ$  (corresponding angles)  
And  $\angle APB$  is common.

So,  $\Delta PAB \sim \Delta PQR$

Since, the ratio of the area of PAB and PQR is 1:4, the ratio of the corresponding sides will be  $(\sqrt{1}) : (\sqrt{4})$ , i.e. 1:2.

$\therefore$  Perimeter of PAB will be half of the perimeter of the triangle PQR, i.e. 12 cm.

Hence, option (b) is the correct answer.

18 (a)

Let the first term be  $a$  and the common ratio be  $r$ .

Given that,

$$a/(1 - r) = 27 \dots\dots\dots(i)$$

$$\text{And } a^2/(1 - r^2) = 243 \dots\dots\dots(ii)$$

Dividing (ii) by (i), we get:

$$a/(1 + r) = 9 \dots\dots\dots(iii)$$

Dividing (iii) by (i), we get:

$$(1 - r)/(1 + r) = 1/3$$

$$\text{Or } 3 - 3r = 1 + r$$

$$\text{Or } 4r = 2$$

$$\text{Or } r = 1/2$$

Hence, option (a) is the correct answer.

19 (a)

Substituting the signs, equation in option (a) becomes:  $3 \times 3 - 1 = 9 - 1 \div 1$  or  $8 = 8$ , which is correct.

Hence, option (a) is the correct answer.

### Explanation for Question numbers 20 to 22:

The weight of bottle O is greater than that of bottle Q, which is just heavier than bottle S.

$$O > Q > S$$

Two bottles have weights between bottle Q and bottle M. So, we get two cases:

$$\text{Case 1: } O > Q > S > \_ > M$$

$$\text{Case 2: } M > \_ > O > Q > S$$

Bottle S is lighter than bottle M, which is heavier than bottle O. Two bottles are heavier than M.

$M > S \rightarrow$  So, Case 1 can be eliminated.

$$\_ > \_ > M > \_ > O > Q > S$$

The weight of bottle P is 15 kg more than that of bottle N, while the weight of bottle N is 22 kg. The weight of bottle P is not the maximum.

$$P(37) > N(22)$$

So, the required arrangement of bottles will be:

$$R > P > M > N > O > Q > S$$

20 (b)

21 (d)

22 (c)

23 (c)

A sum of Rs. 160 is shared among Arun, Banwari and Chandan.

Arun + Banwari + Chandan = Rs. 160 .....(1)

From Statement 1:

Arun + Banwari = Rs. 80 .....(2)

From equation 1 and 2, we get:

Chandan = 80

Thus, Chandan gets Rs. 80.

From Statement 2:

Banwari + Chandan = Rs. 100 .....(3)

From equation 1 and 3, we get:

Arun = 60

Thus, Arun gets Rs. 60.

Combining both the Statements,

Amount received by Banwari =  $(100 + 80) - 160 = \text{Rs. } 20$

Thus, Banwari received Rs. 20.

Hence, the Question can be answered by using both the Statements together.

Hence, option (c) is the correct answer.

24 (b)

**Inference 1 is incorrect:** Refer to the line: “Parents navigate a dynamic journey ...communication, setting boundaries, and providing a supportive environment contribute to a child's emotional well-being.” This line does underline the role of parents in emotional development of their children. However, it does not mean that others (like friends and teachers) do not contribute to emotional well-being of children. So, this inference is not correct.

**Inference 2 is correct:** The given inference is correct as it is based on the lines “*Effective communication, setting boundaries, and providing a supportive environment contribute to a child's emotional well-being.*”

25 (d)

**Option (a) is incorrect:** This option captures only the positive aspect of child-rearing which is a small part of the passage. Other aspects like the challenges of child-rearing are not captured in this option. Also, the passage does not mention that the end goal is for them to become “*responsible and compassionate model citizens.*” Therefore, this answer option is incorrect.

**Option (b) is incorrect:** The passage is about the complexity and good things of child-rearing. Child rearing, as done by parents, includes the transfer of values, skills, and knowledge. However, whether such rearing depends on societal values or not is not covered in the passage. So, this is not the best-implied meaning of the passage.

**Option (c) is incorrect:** The context of child rearing and success is not covered in the passage. The passage does not link good child rearing with a successful life or vice-a-versa. Hence, this is not the best-implied meaning of the passage.

**Option (d) is correct:** The given option is based on the lines “*Balancing discipline with love and fostering independence while ensuring safety present intricate challenges. Parents often find joy in the process of imparting values, skills, and knowledge.*” These lines validate that child rearing is a complex process, but parents do enjoy it.

26 (b)

**Option (a) is incorrect:** This option only covers one aspect of the passage which shows the benefits of globalization as seen in the lines “*While it promotes interconnectedness and shared experiences, it also raises concerns about the loss of cultural diversity.*” However, it misses the issues caused by it in the context of the loss of local culture. So, this is not the most rational inference.

**Option (b) is correct:** The lines “*As a result, local traditions and practices face the risk of erosion or assimilation into a globalized culture (cultural homogenization) ... While it promotes interconnectedness and shared experiences, it also raises concerns about the loss of cultural diversity*” validate this answer option. This option best captures the inference that globalization has threatened local cultures. So, this is the most rational inference from the passage.



**Option (c) is incorrect:** The context of de-globalization is not correct because it is not discussed in the passage. Also, it is not close to the main theme of the passage which is covered in option (b). This option presents an extreme view. So, this is not the most rational inference.

**Option (d) is incorrect:** The given option is not correct because it focuses only on Western culture whereas the main theme of the passage is the impact of globalization on local culture. Moreover, even if true, this does not mean that the promotion of local culture globally is the solution. So, this is not the most rational inference.

27 (b)

As H.C.F is 16, so the numbers must be multiples of 16.

$\therefore p12 = 112$ , or 512, or 912

And,  $7q4 = 704$ , or 784

The product of LCM and HCF of any two numbers is equal to the product of the numbers.

So,  $LCM = (512 \times 784)/HCF = (512 \times 784)/16 = 25088$ . It checks out.

So,  $p = 5$  and  $q = 8$

Hence, option (b) is the right answer.

28 (b)

Suppose Anuj buys 'a' pen, 'b' pencils and 'c' notebooks.

So,  $6a + 5b + 3c = 50$

As he has to buy at least 3 items of each kind, Rs. 42 would get spent.

With the remaining Rs. 8, it is only possible to buy 1 pencil and 1 notebook. Thus, there is only one unique combination in which the items can be bought.

Hence, option (b) is the right answer.

29 (b)

Let us check which of the roads can be used.

X  $\rightarrow$  Affected by flood.  $\rightarrow$  Cannot be used.

Y  $\rightarrow$  Blocked by storm  $\rightarrow$  Cannot be used.

Z  $\rightarrow$  Blocked because 1 is blocked.  $\rightarrow$  Cannot be used.

1  $\rightarrow$  Affected by flood  $\rightarrow$  Cannot be used.

2  $\rightarrow$  Can be used

3  $\rightarrow$  Affected by flood  $\rightarrow$  Cannot be used.

Hence, option (b) is the correct answer.

30 (c)

'BDZBKMLN' is the code of 'CALM'

Each letter of the given words is represented by the letter **preceding** it and the letter **following** it.

(B-C-D), (Z-A-B), (K-L-M), (L-M-N)

Similarly, code for 'TABLE' will be:

S-T-U, Z-A-B, A-B-C, K-L-M, D-E-F

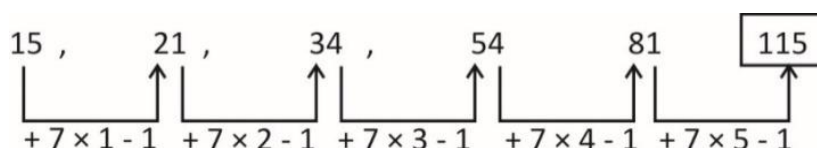
Therefore, **SUZBACKMDF** is the required code.

Hence, option (c) is the right answer.

31 (d)

Given series: 15, 21, 34, 54, 81, ?

Observing above, we get:

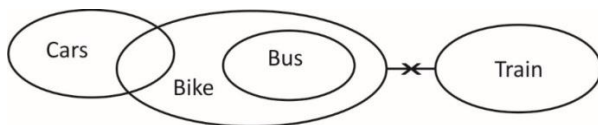


Hence, 115 is the next term.

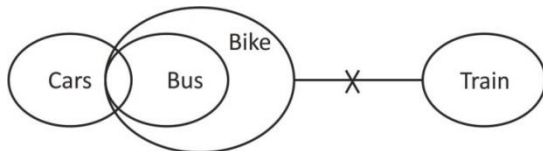
So, option (d) is the right answer.

32 (b)

Case1:



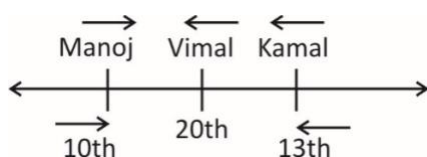
Case2:



From the above diagrams, we can conclude that either conclusion I or conclusion III follows. Hence, option (b) is the correct answer.

33 (a)

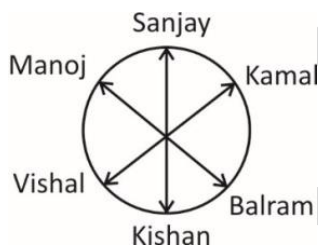
According to the question,



Thus, there are 6 people in between Kamal and Vimal.  
Vimal is third to the right of Manoj. So, there are two people in between Manoj and Vimal.  
Hence, there are a total of  $(6 + 2 + 1)$  i.e. 9 persons in between Manoj and Kamal.  
Hence, option (a) is the right answer.

34 (b)

As per the given information, we can draw the following sitting arrangement:



Hence, it is clear that Vishal is on the left of Kishan.  
So, option (b) is the right answer.

35 (a)

$P = (40\% \text{ of } A) + (60\% \text{ of } B) = 0.4A + 0.6B$   
 $Q = (75\% \text{ of } A) - (25\% \text{ of } B) = 0.75A - 0.25B$   
 $Q \text{ is greater than } P \text{ means } 0.4A + 0.6B < 0.75A - 0.25B$   
 Or  $0.85B < 0.35A$   
 Or  $0.85/0.35 < A/B$   
 Or  $A/B > 17/7$ , i.e.  $A/B > 1$   
 Hence, option (a) is the correct answer.

36 (b)

**Option (a) is incorrect:** The passage is about the issues of traditional cooking methods and the benefits of cleaner fuels. However, this option mentions that poor households are giving up polluting fuels due to their increased awareness which is nowhere mentioned in the passage. So, this is not the best inference.

**Option (b) is correct:** The passage is about issue of polluting cooking fuels that cause deaths as seen in the lines "According to data, millions of deaths annually are attributed to household air pollution from biomass".



and coal combustion.” Therefore, it would be correct to infer that access to clean fuel would save lives in poor households. Hence, this option is the most rational inference of the passage.

**Option (c) is incorrect:** The context of subsidy is not a part of the passage. Also, the relationship between subsidizing cleaner fuels and decreasing poverty is not established in the passage. So, this is not the most rational inference.

**Option (d) is incorrect** as option (a) is incorrect.

**37 (b)**

‘478’ means ‘big rose tree’ .....(i)

‘701’ means ‘small rose garden’ .....(ii)

‘476’ means ‘red rose tree’ .....(iii)

Comparing (i) and (iii), we get:

Code for ‘rose tree’ must be 4/7..... (iv)

Using (iii) and (iv), we get:

6 means red.

Hence, option (b) is the correct answer.

**38 (d)**

Since in 4 minutes, tap X fills 3 buckets.

So, in 1 minute, tap X fills  $\frac{3}{4}$  bucket.

Also,

Since in 6 minutes, tap Y fills 5 buckets.

So, in 1 minute, tap Y fills  $\frac{5}{6}$  bucket.

Again,

Since in 10 minutes, tap Z fills 8 buckets.

So, in 1 minute, tap Z fills  $\frac{8}{10}$  bucket.

So, buckets filled in 1 minute

$$= \frac{3}{4} + \frac{5}{6} + \frac{8}{10}$$

$$= \frac{143}{60}$$

Since 1 bucket can hold 2 gallons of water.

So,  $\frac{143}{60}$  bucket can hold  $2 \times \frac{143}{60} = \frac{286}{60}$  gallons of water.

So, in 1 minute, total water discharge =  $\frac{286}{60}$  gallons.

Since the full tank fills in 1 hour (60 minutes),

So, the capacity of the tank =  $\frac{286}{60} \times 60 = 286$  gallons.

Hence, option (d) is the correct answer.

**39 (c)**

Let the sides of the equilateral triangle and the square be  $s$  and  $a$  respectively.

Area of equilateral triangle =  $(\frac{\sqrt{3}}{4}) s^2$

Area of square =  $a^2$

As per the question,  $(\frac{\sqrt{3}}{4}) s^2 = a^2$

Or  $\sqrt{3}s^2 = 4a^2$  .....(i)

Perimeter of the equilateral triangle =  $3s$

Perimeter of the square =  $4a$

$$(4a)^2 = 16a^2 = 16(\frac{\sqrt{3}}{4})s^2 = 4\sqrt{3}s^2$$

$$\text{Now, } 4\sqrt{3}s^2 < 4(2)s^2 < 9s^2$$

$$\text{Or } 4 \times 4a^2 < 4(2)s^2 < 9s^2 \text{ (Since, } \sqrt{3}s^2 = 4a^2)$$

$$\text{Or } (4a)^2 < (3s)^2$$

$$\therefore 4a < 3s$$

Thus, perimeter of the square is less than that of the equilateral triangle.

Hence, option (c) is the correct answer.

**40 (c)**

Let at present Ajay’s age =  $4x$  years

Then, Sachin’s present age =  $5x$  years

10 years ago:

Ajay's age =  $4x - 10$  years  
 Sachin's age =  $5x - 10$  years  
 According to the question,  
 $(4x - 10)/(5x - 10) = 19/25$   
 Or  $100x - 250 = 95x - 190$   
 Or  $5x = 60$   
 Or  $x = 12$   
 Ajay's present age =  $4x = 48$  years  
 Sachin's present age =  $5x = 60$  years  
 Suresh's present age = Ajay's age + 12 =  $48 + 12 = 60$  years  
 $\therefore$  Required average =  $(48 + 60 + 60)/3 = 56$  years  
 Hence, option (c) is the correct answer.

**41 (d)**

Let, the number of chocolates with Anuj and Basant be  $x$  and  $y$  respectively.

Given,  $x + y = 50$  and  $x^2 + y^2 = 1300$

On solving, we get:

$x = 20, y = 30$

Or

$x = 30, y = 20$

The possible number of chocolates with Anuj and Basant, the rate at which they sell their chocolates and the possible amounts they get are tabulated below.

	A	B	A	B
<b>Number</b>	20	30	30	20
<b>Rate</b>	5	6	5	6
<b>Amount</b>	100	180	150	120
<b>Total amount</b>	280		270	

Hence, option (d) is the correct answer.

**42 (a)**

The password moves in a cyclic order

First letter becomes the last Letter

Second letter becomes the first letter

Third letter becomes the second letter

Fourth letter becomes the third letter

Fifth letter becomes the fourth letter

So, the correct password is WQTRE

Hence, option (a) is the correct answer.

**43 (c)**

Let  $x$  and  $y$  be the units and ten's digits of the two digit number.

Given that;  $y > x$ , and

$10x + y + 10y + x = 2[9(y - x)] + 2$

Or  $11x + 11y = 18y - 18x + 2$

Or  $29x = 7y + 2$

We will check the different values of  $x$  and  $y$  which can satisfy the above equation.

Here,  $x = 2$  and  $y = 8$  is the only solution set that satisfies this equation.

So, Original number =  $yx = 82$

Hence, option (c) is the correct answer.

**44 (a)**

From Statement 1:

The marked price of the article was 30% more than the cost price.

Marked Price (MP) = 130% of CP =  $1.3CP$

Discount% = 20%

So, Selling Price (SP) = (100 - 20)% of MP = 0.8MP

Or SP = (0.8) (1.3) CP = 1.04 CP

Profit = SP - CP = 1.04 CP - CP = 0.04CP

Thus, the article is sold at a profit.

So, statement 1 alone is sufficient.

From statement 2:

If the article had been sold at a discount of 40%, then there would have been a loss of Rs. 50.

Selling Price (SP) = (100 - 40)% of MP = 0.6MP

Loss = CP - SP

Or CP - 0.6MP = 50

Or CP = 50 + 0.6MP

However, if discount is 20%, then SP = 0.8 MP

Loss = CP - SP = 50 + 0.6MP - 0.8MP = 50 - 0.2MP

Profit = SP - CP = 0.8 MP - (50 + 0.6M) = 0.2MP - 50

Thus, we can't say whether the selling price of an article is more than the cost price, or not.

So, statement 2 alone is not sufficient.

Hence, option (a) is the right answer.

**45 (b)**

Ratio of honey and sugar syrup in the vessel after the first replacement = 9:1

When 1 liter of the mixture is taken out, remaining mixture will have  $9/10^{\text{th}}$  of 9 liter as honey.

Quantity of honey in the final mixture =  $9 \times (9/10) = 8.1$  liters

Quantity of sugar syrup in the final mixture =  $10 - 8.1 = 1.9$  liters

Required ratio =  $8.1 : 1.9 = 81 : 19$

Hence, option (b) is the right answer.

**46 (c)**

Salary of Ajay in 2021 = Salary of Anuj in 2021 = 24000  $[1 - (20/100)] = \text{Rs. } 19200$

Salary of Ajay in 2022 =  $19200 [1 + (20/100)] = \text{Rs. } 23040$

Total salary of Anuj in both the years =  $19200 + 24000 = \text{Rs. } 43200$

Total salary of Ajay in both the years =  $19200 + 23040 = \text{Rs. } 42240$

Thus, total salary of Ajay is  $(43200 - 42240)$  i.e. Rs. 960 less than that of Anuj.

$\therefore$  Required percentage =  $(960/43200) \times 100 = (20/9)\%$

Hence, option (c) is the right answer.

**47 (b)**

Average monthly income of Ananya for that year =  $[9(12000) + 3(16000)]/12 = \text{Rs. } 13000$

Hence, option (b) is the right answer.

**48 (b)**

Decadal Difference of Literacy (in terms of percentage point) of:

Kerala =  $94 - 91 = 3$

Lakshadweep =  $92 - 87 = 5$

Mizoram =  $92 - 89 = 3$

Goa =  $87 - 82 = 5$

Puducherry =  $87 - 81 = 6$

Chandigarh =  $86 - 82 = 4$

Delhi =  $86 - 82 = 4$

Puducherry has Decadal Difference of Literacy of 6. So none of the other States/Union Territories has a Decadal Difference of literacy more than Puducherry.

Hence, option (b) is the right answer.

**49 (c)**

The average of the Decadal Difference of Literacies (in terms of percentage point) of the above mentioned States/Union Territories  $= (3+5+3+5+6+4+4)/7$   
 $= 30/7$   
 $= 4.28$   
Hence, option (c) is the right answer.

**50 (c)**

Pipe A supplies water at 50 liters/hour.  
Pipe B can fill the tank in 4 hours.  
Pipe C can empty the tank in 12 hours.  
So, portion of tank filled by pipe A in 1 hour  $= 1 - (1/4) + (1/12) = (5/6)$ th part  
 $\therefore$  Time taken by pipe A to fill the tank  $= 6/5$  hours  
So, Volume of the tank  $= (6/5) \times 50 = 60$  liters  
Hence, option (c) is the correct answer.

**51 (b)**

Total number of ways of selecting 8 boys and 4 girls from 15 boys and 10 girls  $= {}^{15}C_8 \times {}^{10}C_4$ .  
The number of ways A and B are together  $= {}^{14}C_7 \times {}^9C_3$   
Hence, they are never together in  ${}^{15}C_8 \times {}^{10}C_4 - {}^{14}C_7 \times {}^9C_3$  ways  
So, option (b) is the correct answer.

**52 (c)**

Total count of deaths in cities E, F and G  $= 1049 + 1055 + 1322 = 3426$   
Thus, in three cities, the total count of deaths is not greater than 3450.  
Hence, option (a) is not correct.  
The sum of the people injured in cities A and D  $= 11756 + 3912 = 15668$   
Thus, sum of the people injured in city A and D is not less than 15000.  
Hence, option (b) is not correct.  
By looking at the chart, we can conclude that cities D, E and F had less than 5000 accidents.  
Hence, option (c) is the correct answer.

**53 (c)**

Total numbers of accidents  $= 11303 + 8111 + 6340 + 4390 + 4441 + 4997 + 6315 = 45897$   
Total number of injured people  $= 11756 + 3425 + 5383 + 3912 + 4744 + 4092 + 5440 = 38752$   
Required difference  $= 45897 - 38752 = 7145$   
Hence, option (c) is the correct answer.

**54 (c)**

The letter K is inside all the shapes.  
Thus, letter K means lawyer, thief, artist and businessman.  
Hence, option (c) is the right answer.

**55 (d)**

Expense on transportation and decoration work  $= 12 + 15 = 27\%$   
Expense on construction material and labour  $= 30 + 21 = 51\%$   
 $\therefore$  Required percentage  $= (27/51) \times 100 = 52.94\%$   
Hence, option (d) is the correct answer.

**56 (d)**

Speed of rowing in still water,  $x = 7.5$  km/h.  
Speed of water current,  $y = 1.5$  km/h.  
Speed downstream,  $u = x + y = 7.5 + 1.5 = 9$  km/h.  
Speed upstream,  $v = x - y = 7.5 - 1.5 = 6$  km/h.  
So, the average speed of rowing

$$\begin{aligned}
 s_{av} &= 2uv/(u+v) \\
 &= (2 \times 9 \times 6)/(9+6) \\
 &= (2 \times 9 \times 6)/15 \text{ km/h.}
 \end{aligned}$$

Time = 3 hours 20 minutes = 320/60 hours = 31/3 h = 10/3 h.

Distance = Average speed  $\times$  Time =  $(2 \times 9 \times 6)/15 \times 10/3 = 24$  km.

But this distance is for both going from place A to place B and then coming back (from place B to place A).

So, the distance between place A and place B =  $24/2 = 12$  km.

So, option (d) is the correct answer.

57 (d)

Let the total number of students = n.

Number of students to the left of Raman = 6.

Number of students to the right of Rohan = 13.

Number of students between Raman and Rohan =  $n/4$ .

Total number of students in the row =  $6 + 13 + 2 + n/4 = n$

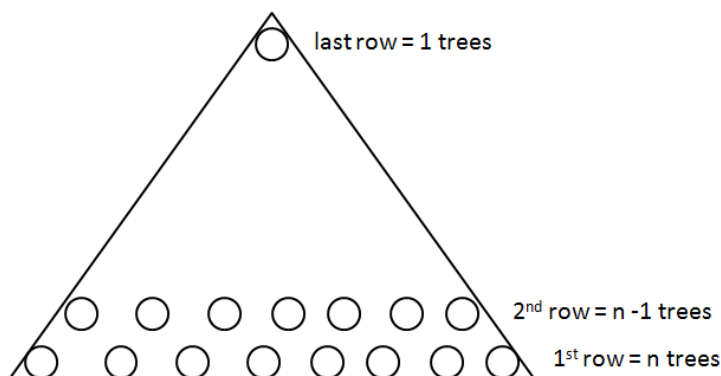
So,  $3n/4 = 21$

Or  $n = 28$ .

Hence, option (d) is the correct answer.

58 (b)

The arrangement of trees is somewhat as shown in the picture below:



The first row has n trees; second row has n-1 trees and so on till the last row which will have 1 tree.

So, total number of trees =  $n + (n-1) + (n-2) + \dots + 1 = n(n+1)/2$

As given in the question,  $n(n+1)/2 = 55$

So,  $n = 10$

Hence, option (b) is the correct answer.

59 (d)

**Inference 1 is incorrect:** The passage is about smartphone addiction and the issues associated with it. However, this option mentions the dopamine cycle and viral news which is not explicitly mentioned in the passage. Even if we assume it to be true, it would be an extreme statement to say that they make it “impossible” to break free from phone addiction.

**Inference 2 is incorrect:** The given inference seems to be based on the following lines “*Social relationships can suffer as individuals prioritize virtual connections over face-to-face interactions.*” Here, the passage mentions preferring virtual connections whereas the inference is about valuing full isolation more than face-to-face interactions which is not correct because full isolation includes isolating digitally as well

60 (d)

**Assumption 1 is incorrect:** The passage clearly states “...climate change-induced disruptions can lead to conflicts over scarce resources.” The passage does not state that climate change is the only factor causing conflicts over scarce resources. So, this assumption is incorrect.

**Assumption 2 is incorrect:** The passage does not contain any context of global organizations and governments. Hence, this assumption is not based on the information contained in the passage.

61 (d)

**Assumption 1 is incorrect:** The given assumption is based on the premise that with high population growth there will be a large young population. However, to assume that such a young population would help reap better dividend would not be correct, because the demographic dividend is not only based on a large young population, it needs adequate skills and employment. So, this assumption is not correct.

**Assumption 2 is incorrect:** The given assumption is based on the following lines “*The services sector, including technology and finance, is likely to witness heightened demand globally, driven by an expanding middle class.*” However, these lines mean that the service sector expands due to the increasing middle class and not vice versa, as stated in this assumption statement. So, this assumption is not valid.

**Explanation for question 62 and 63:**

Let us represent the data in the form of a table.

M and S are good in subjects 2 and 3. A and M are good in subjects 3 and 1.

Student	Good in Subject
M	2, 3, 1
S	2, 3
A	3, 1

A, P and N are good in subjects 1 and 5. N and A are good in subjects 1 and 4. P and S are good in subjects 5 and 2.

Student	Good in Subject
M	2, 3, 1
S	2, 3, 5
A	3, 1, 5, 4
P	1, 5, 2
N	1, 5, 4

62 (d)

N is good in 1, 4 and 5 but not 3.

Hence, option (d) is the correct answer.

63 (a)

A is good in 5, 1, 3 and 4.

Hence, option (a) is the correct answer.

64 (d)

Let  $x$  (Rs) be the fixed cost and  $y$  (Rs/guest), the variable cost.

Then,

$$x + 50y = 50000 \dots\dots\dots(I) \quad \text{and}$$

$$x + 100y = 80000 \dots\dots\dots(II).$$

From (I) and (II), we get,

$$y = 600 \text{ and } x = 20000.$$

Now let the average expense of 200 guests be Rs ‘ $z$ ’,

Since the variable cost of the guest house is linearly related to the number of guests

$$\text{Therefore, } 200 \times z = x + 200y = 20000 + 600 \times 200$$

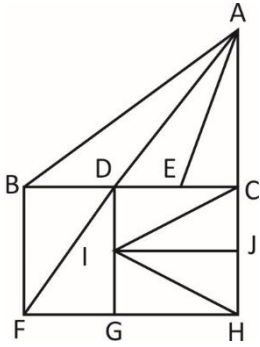
$$\text{or } z = \text{Rs } 700$$

Hence, option (d) is the correct answer.



65 (d)

Given figure:



The rectangles in the given figure: BCFH, BDFG, DCIJ, IJGH, DCGH

So, there are 5 rectangles.

The triangles in the given figure: BDF, FDG, DIC, ICJ, IJH, IHG, ICH, ABD, ADE, AEC, ABE, ADC, ABC, ABF, AFH

So, there are 15 triangles.

Their product =  $5 \times 15 = 75$

Their sum =  $5 + 15 = 20$

Hence, option (d) is the correct answer.

66 (c)

Given matrix:

Column Row	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>
R <sub>1</sub>	LX	GT	DK
R <sub>2</sub>	IR	TV	KP
R <sub>3</sub>	XU	?	NM

Let's consider  $R_1C_1$ ,

In the term 'LX', the product of the alphabetical position of L (12) and reverse alphabetical position of X (3) =  $12 \times 3 = 36 = (6)^2$ .

Applying a similar pattern in the whole matrix, we get:

LX	GT	DK
36	49	64
IR	TV	KP
81	100	121
XU	?	NM
144	169	196

$R_1C_2 = GT = \text{alphabetical value of G} \times \text{reverse alphabetical value of T} = 7 \times 7 = 7^2$

$R_1C_3 = DK = \text{alphabetical value of D} \times \text{reverse alphabetical value of K} = 4 \times 16 = 8^2$

$R_2C_1 = IR = \text{alphabetical value of I} \times \text{reverse alphabetical value of R} = 9 \times 9 = 9^2$

$R_2C_2 = TV = \text{alphabetical value of T} \times \text{reverse alphabetical value of V} = 20 \times 5 = 10^2$

$R_2C_3 = KP = \text{alphabetical value of K} \times \text{reverse alphabetical value of P} = 11 \times 11 = 11^2$

$R_3C_1 = XU = \text{alphabetical value of X} \times \text{reverse alphabetical value of U} = 24 \times 6 = 12^2$

$R_3C_2 = 169 = 13 \times 13 = \text{alphabetical position of M} \times \text{reverse alphabetical position of N} = \text{MN}$

$R_3C_3 = NM = \text{alphabetical value of N} \times \text{reverse alphabetical value of M} = 14 \times 14 = 14^2$

Hence, required term is 'MN'.

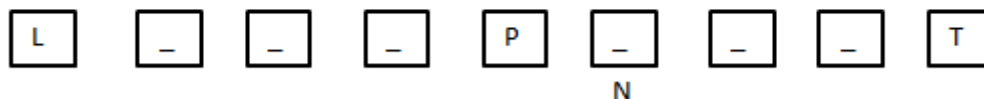
So, option (c) is the correct answer.

67 (d)

Each of the nine hamlets is along the bank of a river and the distance between two adjacent hamlets is 1 km. So, it is clear that all the hamlets lie along the same line.

P is 4 km east from L and T is 4 km east from P. Thus, L and T are at the two ends and P is the middle hamlet.

Thus, the nine hamlets lie on the bank of the river as shown in the picture below:



N is 3 km from T. So, N has to come in the position as shown in the above picture.

Distance between L and N = Distance between L and P + Distance between P and N  
= 4km + 1 km = 5 km.

Hence, option (d) is the correct answer.

68 (a)

Percentage strength of the acid in the mixture = (Quantity (volume) of the acid in the mixture)/(Total volume) × 100

=  $(\frac{5 \times 20}{100} + \frac{7.5 \times 80}{100}) / (5 + 7.5) \times 100 = (5 \times 20 + 7.5 \times 80) / (5 + 7.5) = 56\%$

Hence, option (a) is the correct answer.

69 (c)

Let the marks scored in five subjects be 4x, 5x, 6x, 7x and 8x (on a scale of 100).

Average score = 60% = 60 marks

So,  $(4x + 5x + 6x + 7x + 8x) / 5 = 60$

or x = 10.

So, the marks obtained are 40, 50, 60, 70 and 80.

Hence the number of papers in which he got at least 70% marks = 2 (70 & 80).

Hence, option (c) is the correct answer.

70 (c)

**Option (a) is incorrect:** The passage is not about the patience for achieving success. It shows two sides of life in various scenarios like “...every peak is preceded by a valley” and “Every triumph bears the silent scars of past.” So, this option does not reflect the logical inference from the passage.

**Option (b) is incorrect:** This option is about perseverance and wisdom, but the passage just shows two different sides in various aspects of life. So, this is not the best inference from the passage.

**Option (c) is correct:** The given passage discusses the two sides of life in different conditions like “**Every triumph bears the silent scars of past challenges, and every setback carries the potential for growth and resilience. Understanding life allows for a holistic perspective, encouraging an embrace of both light and shadow.**” These lines show that life is a coin wherein success and failure are two sides of the same coin. So, this option is the most logical inference.

**Option (d) is incorrect:** The passage does not mention knowledge as the ultimate objective of life. Therefore, this answer option is incorrect.

71 (b)

**Option (a) is incorrect:** The passage shows how leadership is helpful in handling wars. However, this option states the other way round - war as essential to learn leadership qualities, which is not correct. So, this option is not the best crux of the passage.

**Option (b) is correct:** The given passage is about leadership and how it helps in handling war scenarios. Leadership can be inherent or learned through training. The idea that such a unique blend of leadership is helpful in handling wars is visible in the lines “**While innate traits like resilience and adaptability**

*contribute, structured training cultivates the skills needed to navigate the complexities of warfare.”*

Hence, this option best reflects the crux of the passage.

**Option (c) is incorrect:** The passage is about learning/ acquiring leadership skills for wars. The line “...structured training cultivates the skills needed to *navigate the complexities of warfare*” suggests that training could be imparted externally. Therefore, it would be incorrect to say that leadership can ‘only’ be self-acquired; it can also be externally taught. Therefore, this answer option is incorrect.

**Option (d) is incorrect:** The given option compares the two kinds of leaderships which is not discussed in the passage. The main theme of the passage is not the comparison of war-experienced leadership and the leadership acquired through training. So, this is not the best crux of the passage.

72 (d)

**Option (a) is incorrect:** The passage is on the clashes between India’s food security concerns and WTO norms. The given option means that India does not adhere to international trade norms, which is not reflected in the passage. Also, reforming agricultural laws and policies is not the core idea of the passage. Hence, this option is incorrect.

**Option (b) is incorrect:** The given option is extreme and is not based on the passage. The passage shows the concerns that India faces in food security by following WTO norms. The author nowhere hints towards leaving WTO. The main theme of the passage is that it is difficult to balance both aspects. So, this is not the correct option.

**Option (c) is incorrect:** Whether WTO norms are discriminatory is not mentioned in the passage. Also, how those discriminatory norms restrict India’s commitment to food security is not mentioned in the passage. So, this option is beyond the scope of the passage and is, therefore, incorrect.

**Option (d) is correct:** The central theme of the passage is the challenges India faces in ensuring food security in the backdrop of WTO norms. This is reflected in the lines “*However, the clash between India's domestic support programs and WTO norms creates tension. The need to uplift millions from poverty and hunger clashes with the demands of international trade agreements.*” This option captures this theme comprehensively.

73 (b)

**Option (a) is incorrect:** The context of developed and developing countries is nowhere mentioned in the passage. So, this option is beyond the scope of the passage and is not the most rational inference.

**Option (b) is correct:** The main issue in fighting climate change as per the passage is funding as seen in the lines “*Implementing measures to reduce greenhouse gas emissions, transition to renewable energy sources, and enhancing climate resilience necessitate financial investments*” and “*Ultimately, viewing the costs of climate action as an investment in a sustainable and resilient future underscores the importance of proactive measures.*” Therefore, we can infer that when cost is central to fighting climate change, then without funding and proactive measures, almost everyone will face the brunt of climate change. These arguments are aptly captured in this answer option.

**Option (c) is incorrect:** The main theme of the passage is the core issue of funding which is essential to fighting climate change. Mitigation and adaptation measures are only a part of the passage and not the central theme of the passage. So, this option is not at all the most rational inference.

**Option (d) is incorrect:** The given option is quite broad, generic, vague and not quite specific to the information contained in the passage. The passage primarily discusses the issues of funding in every aspect of fighting climate change. This is not captured in this answer option. So, this option is not the most rational inference of the passage.

74 (d)

**Assumption 1 is incorrect:** The passage mainly focuses on exports and their importance for economic growth. However, it does not mean that every country must necessarily have an open economy. So, the assumption that no country can have a closed economy is not correct because the passage does not imply this anywhere.

**Assumption 2 is incorrect:** It may be possible for an economy grow even when businesses do not compete internationally. Also, the issue of “tariff protection” has not been discussed in the passage. Therefore, this answer option is incorrect.

75 (a)

**Option (a) is correct:** The given option is based on the lines “*The positive correlation between exports and economic growth is evident through various channels. Exports boost a nation's income by generating revenue from foreign markets. This influx of funds can be utilized for domestic investment, infrastructure development, and social programs, all of which contribute to economic advancement.*” These lines explain that exports are crucial for the economic development of a country and are crucial for overall prosperity. Hence, this option best captures the crux of the passage.

**Option (b) is incorrect:** The passage is specific to exports and does not mention other ways of economic growth and social prosperity. So, the conclusion that exports alone are insufficient is not based on the information provided in the passage. Therefore, this answer option is incorrect.

**Option (c) is incorrect:** The context of imports is not discussed in the passage. The relative amount of exports and imports, and their impact on economic growth is not discussed in the passage. So, this is not the best crux of the passage.

**Option (d) is incorrect:** The context of India is not discussed in the passage. The author talks about the role of exports in overall economic growth, without specifically mentioning any particular country. Therefore, this answer option is incorrect.

76 (b)

Given matrix:

	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>
R <sub>1</sub>	28	42	48
R <sub>2</sub>	12	14	15
R <sub>3</sub>	4	?	6
R <sub>4</sub>	84	98	120

In C<sub>1</sub>,

$$84 \div 12 = 7; 7 \times 4 = 28$$

Similarly, in C<sub>3</sub>,

$$120 \div 15 = 8; 8 \times 6 = 48$$

Applying the same pattern in C<sub>2</sub>,

$$98 \div 14 = 7; 7 \times 6 = 42$$

So, ? = 6

Hence, option (b) is the right answer.

77 (b)

At least two matches have to be held in Tier I cities. It is given that B is rejected. So, A and C have to be selected as venues.

We know that Y is selected as a venue.

Direct link between W and Y is damaged. So W cannot be selected as venue.

C and Z are not connected directly. So, Z cannot be selected as venue.

So, from Tier II cities, X and Y can be selected as venues.

Thus, the possible selections are A, C, X and Y.

Hence, option (b) is the correct answer.

78 (c)

This question can be solved by using the options:

Option (a) → A, B, C and W. → B and W are not connected directly. Thus, this combinations is not possible.

Option (b) → A, B, C and Z → C and Z are not connected directly. Thus, this combinations is not possible.

Option (c) → A, B, C and X → This combination is possible.

Option (d) → A, W, Y and Z → The direct road between W and Y has been damaged due to floods. Thus, this combinations is not possible. Also, atleast two tier I cities must be selected.

Hence, option (c) is the correct answer.

79 (b)

If A, B and C are selected as venues then W and Z cannot be selected as venues because Cities B & W and C & Z are not directly connected to each other.

Thus, either city X or Y can be selected as the fourth venue.

So, there are two possible options which are as follows:

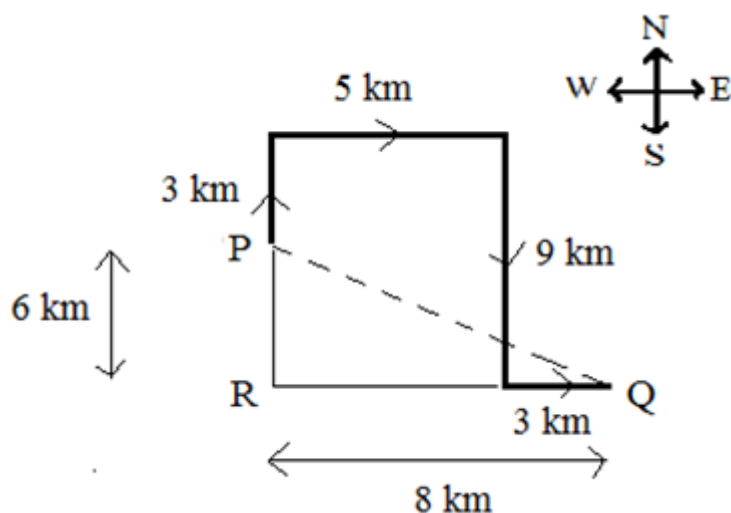
1. A, B, C and X

2. A, B, C and Y

Hence, option (b) is the correct answer.

80 (d)

Path of Rohit can be represented as follows:



In triangle PQR, PQ can be calculated as follows:

$$PQ^2 = 6^2 + 8^2$$

$$\text{or } PQ = \sqrt{6^2 + 8^2} = 10 \text{ km}$$

Hence, option (d) is the correct answer.

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