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SSC CHSL Pre

Solution

SHP-9III54235-E



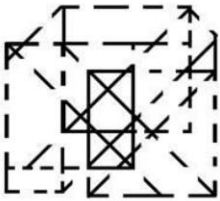
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General Intelligence and Reasoning

1. **Solution: B**
The logic followed here is as follows:
From the left end, 1st and 2nd letters are interchanged and 3rd and 5th letters are interchanged and 4th letter remain at the same position.
In 'RIDGE: IREGD':
- | | | | | |
|---|---|---|---|---|
| R | I | D | G | E |
| I | R | E | G | D |
- So, 'RIDGE' is related to 'IREGD'.
Similarly, in 'ACTOR: ?':
- | | | | | |
|---|---|---|---|---|
| A | C | T | O | R |
| C | A | R | O | T |
- So, 'ACTOR' is related to 'CAROT'.
2. **Solution: B**
All of the above words are synonyms of each other except 'Secular'.
3. **Solution: C**
The logic followed here is:
 $2^{\text{nd}} \text{ number} = (3 \times 1^{\text{st}} \text{ number}) + 7$
In option 'A', '24 - 79':
 $1^{\text{st}} \text{ number} = 24, 2^{\text{nd}} \text{ number} = (3 \times 24) + 7 = 79$
In option 'B', '11 - 40':
 $1^{\text{st}} \text{ number} = 11, 2^{\text{nd}} \text{ number} = (3 \times 11) + 7 = 40$
In option 'C', '26 - 95':
 $1^{\text{st}} \text{ number} = 26, 2^{\text{nd}} \text{ number} = (3 \times 26) + 7 = 85 \neq 95$
In option 'D', '19 - 64':
 $1^{\text{st}} \text{ number} = 19, 2^{\text{nd}} \text{ number} = (3 \times 19) + 7 = 64$
Therefore, all of the above options, except option 'C', follow the same logic.
4. **Solution: D**
The pattern followed here is as follows:
 $43 + 11 = 54$
 $54 + 13 = 67 \neq 64$
 $67 + 17 = 84$
 $84 + 19 = 103$
 $103 + 23 = 126 \neq 129$
 $126 + 29 = 155$
So, the wrong terms in the given series are '64' and '129'.
The correct series is:
43, 54, 67, 84, 103, 126, 155
5. **Solution: D**
The logic followed here is shown below:
In option 'A', '5560 - 3210':
 $= 5560 - 2350$
 $= 3210$
In option 'B', '7634 - 5284':
 $= 7634 - 2350$
 $= 5284$
In option 'C', '4738 - 2388':
 $= 4738 - 2350$
 $= 2388$
In option 'D', '9530 - 7270':
 $= 9530 - 2350$
 $= 7180$
 $7180 \neq 7270$
So, the number in the set '9530 - 7270' is the odd one.
6. **Solution: B**
The embedded figure is shown below:



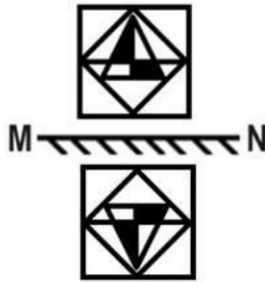
7. **Solution: D**
I: 548 means 'beware of fraud'
II: 421 means 'fraud happens everyday'
III: 179 means 'everyday is new'
From statement I and II, we conclude that 'fraud' is coded as '4'.
From statement II and III, we conclude that 'everyday' is coded as '1'.
From statement I alone, we conclude that 'beware' and 'of' is coded as '5' and '8', however not necessarily in the same order.
From statement II alone, we conclude that 'happens' is coded as '2'.
From statement III alone, we conclude that 'is' and 'new' is coded as '7' and '9', however not necessarily in the same order.
The words and their respective codes are as follows:
- | Word | beware | of | fraud | happens | everyday | is | new |
|------|--------|-----|-------|---------|----------|-----|-----|
| Code | 5/8 | 8/5 | 4 | 2 | 1 | 7/9 | 9/7 |
- So, the code for 'new happens' is either '92' or '72'.
8. **Solution: A**
Following figures can be formed:
-
- Conclusions:
I. Some Set are Collect. Doesn't follow. (As, there is no direct relation between Set and Collect, so, no definite conclusions follow.)
II. Some Reset are Collection. Follow. (As, some Reset are Set and all Set are Collection, so, some Reset, which are Set are also Collection.)
III. Some Reset are Collect. Doesn't follow. (As, there is no direct relation between Reset and Collect, so, no definite conclusions follow.)
So, only conclusion II follows.
9. **Solution: D**
After unfolding the paper, we get:
-

10. **Solution: B**
The pattern followed here is:
The 2nd number is the sum of 1st number and 12 and the 3rd number is 2.5 times of the 2nd number.
In (18, 30, 75),
 $1^{\text{st}} \text{ number} = 18, 2^{\text{nd}} \text{ number} = (18 + 12) = 30,$
 $3^{\text{rd}} \text{ number} = (30 \times 2.5) = 75$
In (78, 90, 225),

1st number = 78, 2nd number = $(78 + 12) = 90$,
3rd number = $(90 \times 2.5) = 225$
In option 'a': (13, 25, 65)
1st number = 13, 2nd number = $(13 + 12) = 25$,
3rd number = $(25 \times 2.5) = 62.5 \neq 65$
In option 'b': (47, 59, 147.5)
1st number = 47, 2nd number = $(47 + 12) = 59$,
3rd number = $(59 \times 2.5) = 147.5$
In option 'c': (56, 68, 170.5)
1st number = 56, 2nd number = $(56 + 12) = 68$,
3rd number = $(68 \times 2.5) = 170 \neq 170.5$
In option 'd': (43, 55, 138)
1st number = 43, 2nd number = $(43 + 12) = 55$,
3rd number = $(55 \times 2.5) = 137.5 \neq 138$

11. **Solution: D**

The correct mirror image is shown below:



12. **Solution: B**

The logic followed here is:

In each row,

2nd number = $[(1^{\text{st}} \text{ number} \div 2) - (\text{digit at one's place of } 1^{\text{st}} \text{ number})]$

3rd number = $(2^{\text{nd}} \text{ number} \times 5)$

In row I,

1st number = 88

2nd number = 36

3rd number = 180

2nd number = $[(88 \div 2) - 8]$

2nd number = $44 - 8$

2nd number = 36

3rd number = 36×5

3rd number = 180

Similarly, in row III,

1st number = 64

2nd number = 28

3rd number = 140

2nd number = $[(64 \div 2) - 4]$

2nd number = $32 - 4$

2nd number = 28

3rd number = 28×5

3rd number = 140

Similarly, in row II,

1st number = 102

2nd number = $[(102 \div 2) - 2]$

2nd number = $51 - 2$

2nd number = 49

Or,

2nd number = $245 \div 5$

2nd number = 49

So, '49' will come in place of '?'.

So, the complete figure is:

88	36	180
10s2	49	245
64	28	140

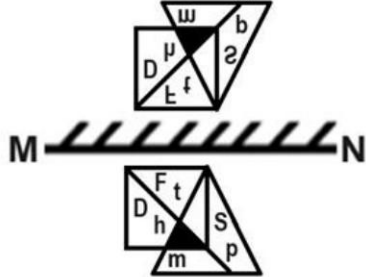
13. **Solution: C**

The correct dictionary order of the following words is:
2 - Imbibe, 3 - Imitate, 4 - Immature, 1 - Imperfect, 5 - Impress

'Immature' will come at third position.

Solution: A

The correct mirror image is shown below:



14. **Solution: B**

The pattern followed here is:

Z	R	M	E
+1	-1	+2	-2
A	Q	O	C
+1	-1	+2	-2
B	P	Q	A
+1	-1	+2	-2
C	O	S	Y
+1	-1	+2	-2
D	N	U	W

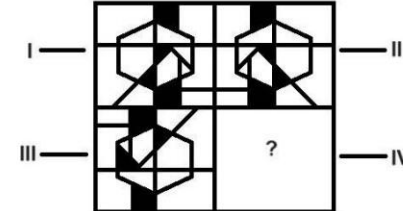
So, 'AQOC' will complete the series.

Therefore, the complete series is:

ZRME, AQOC, BPQA, COSY, DNUW

Solution: C

Given:

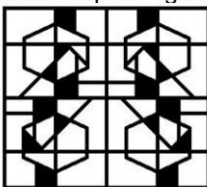


The logic followed here is as follows,
II is the mirror image of I. Similarly, IV is the mirror image of III

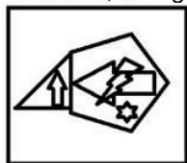
Thus, the figure that will replace the question mark is as follows,



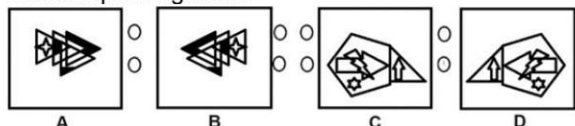
The complete figure is as follows:



17. **Solution: A**
The logic followed here is:
Figure 'B' is the mirror image of figure 'A', similarly figure 'D' will be the mirror image of figure 'C'.
Therefore, the figure which will come in place of '?' is:



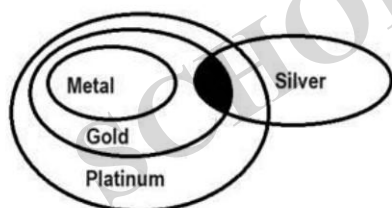
The complete figure is:



18. **Solution: D**
The pattern followed here is:
 $56 - 9 = 47$
 $47 + 18 = 65$
 $65 - 27 = 38$
 $38 + 36 = 74$
 $74 - 45 = 29$
So, '65' will come in place of '?'.
The complete series will be:
56, 47, 65, 38, 74, 29

19. **Solution: B**
Given equation:
 $990 \div 9 \odot 12 \in 7 \otimes 216 \neq 12$
After decoding the code, we get:
 $990 \div 9 + 12 \times 7 - 216 \div 12$
On applying BODMAS rule
 $= 990 \div 9 + 12 \times 7 - 216 \div 12$
 $= 110 + 84 - 18$
 $= 194 - 18$
 $= 176$
The value of the given expression is '176'.

20. **Solution: A**
Following figures can be formed:



Conclusions:

- I. Some Gold are not Platinum. Doesn't follow (As, there is no negative relation between Gold and Platinum. So, no definite negative conclusion follows.)
II. All Metal are Platinum. Follows (As, all Metal are Gold and all Gold are Platinum. So, all Metal which are Gold are also Platinum.)
III. Some Metal are not Platinum. Doesn't follow (As, all Metal are Gold and all Gold are Platinum. So, no definite negative conclusion follows.)
Only conclusion II follows.

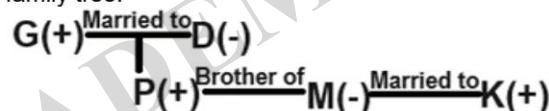
21. **Solution: B**
A group of flowers is called 'Bouquet', similarly, a group of Lions is called 'Pride'.

22. **Solution: C**
The total age of 15 men = $15 \times 24 = 360$
The total age of 18 women = $18 \times 21 = 378$
Total age of 15 men and 18 women = $360 + 378 = 738$

The average age of total men and women = $738 \div (15 + 18)$
 $738 \div 33 = 22.36$
The approximate average age of 15 men and 18 women is 22 years.

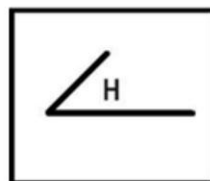
23. **Solution: B**
Given equation: $120 - 225 \div 15 + 7 \times 20$
Equation after interchanging the given two signs,
 $120 - 225 \div 15 \times 7 + 20$
Applying BODMAS rule, we get,
 $= 120 - 15 \times 7 + 20$
 $= 120 - 105 + 20$
 $= 140 - 105$
 $= 35$
So, the value of the given equation after interchanging the given two signs is '35'.

24. **Solution: D**
After decoding the code, we get:
G % P means G is the father of P
P \$ K means P is the brother-in-law of K
K @ M means K is the spouse of M
M & D means M is the daughter of D
D @ G means D is the spouse of G
From the above information, we make the following family tree:

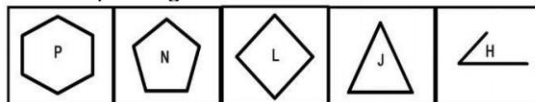


So, D is the mother-in-law of K.

25. **Solution: C**
The pattern followed here is:
The number of sides is in decreasing with every figure. In first figure, there is a hexagon, in second figure, there is a pentagon, in third figure, there is a square, in fourth figure, there is a triangle, so, in fifth figure, there will be a shape with two sides.
The alphabets in each figure are 2nd preceding letters of alphabet in the previous figure.
So, the figure given in option 'c' will come in place of '?'.



The complete figure is shown below:



Quantitative Aptitude

26. **Solution: B**
Sum of the weights of 49 students = $49 \times 43.5 = 2,131.5$ kg
New average weight = $43.5 + 0.72 = 44.22$ kg
Let the weight of the teacher be 'N' kg.
So, $(2,131.5 + N) = 44.22 \times (49 + 1)$
Or, $2,131.5 + N = 2,211$
Or, 'N' = $2,211 - 2,131.5 = 79.5$
Therefore, the weight of the teacher = 'N' kg = 79.5 kg
27. **Solution: A**
Let initial cost price of the goods be ₹'100x'

ATQ;

$$(0.86 \times 100x) + 384 = (1.18 \times 100x)$$

$$\text{Or, } 32x = 384$$

$$\text{So, 'x' = 12}$$

$$\text{Cost price of the goods} = 100x = 100 \times 12 = ₹1,200$$

$$\text{Therefore, required selling price} = 1.33 \times 1,200 = ₹1,596$$

Hence, option a.

28. **Solution: A**

Let the speed of the boat in still water be 'x' km/h

The speed of the boat in downstream = $(x + 4)$ km/h

And, speed of the boat in upstream = $(x - 4)$ km/h

ATQ;

$$\{48/(x + 4)\} + \{48/(x - 4)\} = 5$$

$$\text{Or, } 48x - 192 + 48x + 192 = 5 \times (x^2 - 16)$$

$$\text{Or, } 96x = 5x^2 - 80$$

$$\text{Or, } 5x^2 - 96x - 80 = 0$$

$$\text{Or, } 5x^2 - 100x + 4x - 80 = 0$$

$$\text{Or, } 5x(x - 20) + 4(x - 20) = 0$$

$$\text{Or, } (5x + 4)(x - 20) = 0$$

$$\text{Or, 'x' = 20 or } (-4/5)$$

Speed can't be negative so, $(-4/5)$ is not possible.

Now, speed of boat in still water = 20 km/h

$$\text{Therefore, required ratio} = (20 + 4) : (20 - 4) = 24:16 = 3:2$$

Hence, option a.

29. **Solution: D**

$$a^2 + b^2 + c^2 = 4 \times (3a + 4b + 5c) - 200$$

$$\text{Or, } a^2 + b^2 + c^2 = 12a + 16b + 20c - 200$$

$$\text{Or, } a^2 - 12a + 36 + b^2 - 16b + 64 + c^2 - 20c + 100 = 0$$

$$\text{Or, } (a - 6)^2 + (b - 8)^2 + (c - 10)^2 = 0$$

It is possible if $(a - 6) = 0$, $(b - 8) = 0$ and $(c - 10) = 0$

So, 'a' = 6, 'b' = 8 and 'c' = 10

$$\text{Required value} = (2 \times 6) + (3 \times 8) - 10 = 12 + 24 - 10 = 26$$

Hence, option d.

30. **Solution: B**

$$\text{Effective rate of interest} = (32/4) = 8\%$$

$$\text{Effective time period} = (6/3) = 2$$

$A = P \left(1 + \frac{R}{100}\right)^t$, where 'R' and 'T' are rate of interest and time period respectively

$$\text{So, } A = 2,500 \times \left(1 + \frac{8}{100}\right)^2$$

$$\text{Or, } A = 2,500 \times \left(1 + \frac{25}{100}\right)^2$$

$$\text{So, } A = 2,500 \times \left(\frac{27}{25}\right)^2 = ₹2,916$$

$$\text{Therefore, compound interest earned} = 2,916 - 2,500 = ₹416$$

Hence, option b.

31. **Solution: C**

Let present age of son = 'x' years

So, present age of Rudraksh = '2.5x' years

ATQ;

$$2.5x + 12 = 2(x + 12)$$

$$\text{Or, } 2.5x + 12 = 2x + 24$$

$$\text{Or, } 0.5x = 12$$

$$\text{So, 'x' = 24}$$

$$\text{Therefore, present age of his wife} = (2.5 \times 24) - 3 = 60 - 3 = 57 \text{ years}$$

Hence, option c.

32. **Solution: B**

$$\text{Wage of 1 day of 10 men and 10 women together} = (2,640/12) = ₹220$$

$$\text{Wage of 1 day of 20 men and 40 women together} = (14,000/20) = ₹700$$

Let earning of each man and each woman per day is ₹'m' and ₹'w', respectively

$$\text{So, } 10m + 10w = 220$$

$$\text{Or, } m + w = 22 \dots \dots \dots (I)$$

$$\text{And, } 20m + 40w = 700$$

$$\text{Or, } m + 2w = 35 \dots \dots \dots (II)$$

On subtracting equation I from II, we have;

$$(m + 2w) - (m + w) = 35 - 22$$

$$\text{Or, 'w' = 13}$$

On putting value of 'w' in equation I, we have;

$$13 + m = 22$$

$$\text{Or, 'm' = 9}$$

$$\text{Wages of 18 men and 12 women together} = (18 \times 9) + (12 \times 13) = ₹318 \text{ per day}$$

$$\text{So, required number of days} = (2,544/318) = 8$$

Hence, option b.

33. **Solution: A**

Let the initial quantities of liquid 'A' and liquid 'B' in the mixture be '5x' litres and '2x' litres, respectively.

$$\text{Quantity of liquid 'A' in 14 litres of mixture} = (5/7) \times 14 = 10 \text{ litres}$$

$$\text{Quantity of liquid 'B' in 14 litres of mixture} = 14 - 10 = 4 \text{ litres}$$

ATQ;

$$(5x - 10) = (15/13) \times (2x - 4 + 14)$$

$$\text{Or, } 65x - 130 = 30x + 150$$

$$\text{Or, } 35x = 280$$

$$\text{So, 'x' = 8}$$

$$\text{Therefore, initial quantity of liquid 'B' = } 2 \times 8 = 16 \text{ litres}$$

Hence, option a.

34. **Solution: A**

$$72 \times [120 \div \{64 + (18 \times 2 - 14) - 13 \times 2\} \times 12 + 12] \div 18$$

$$= 72 \times [120 \div \{64 + (36 - 14) - 26\} \times 12 + 12] \div 18$$

$$= 72 \times [120 \div \{64 + 22 - 26\} \times 12 + 12] \div 18$$

$$= 72 \times [120 \div \{86 - 26\} \times 12 + 12] \div 18$$

$$= 72 \times [120 \div 60 \times 12 + 12] \div 18$$

$$= 72 \times [2 \times 12 + 12] \div 18$$

$$= 72 \times [24 + 12] \div 18$$

$$= 72 \times 36 \div 18$$

$$= 72 \times 2$$

$$= 144$$

Hence, option a.

35. **Solution: A**

Let, the fourth proportional be 'x'.

ATQ,

$$(24/16) = (21/x)$$

$$\text{Or, } (21/x) = (3/2)$$

$$\text{Or, } x = 14$$

Hence, option a.

36. **Solution: C**

We know that, $\text{sum} = \left\{ \frac{x}{\left(1 + \frac{r}{100}\right)} + \frac{x}{\left(1 + \frac{r}{100}\right)^2} \right\}$, where x is the value of each instalment.

$$\text{So, } 16,400 = \left\{ \frac{x}{\left(1 + \frac{5}{100}\right)} + \frac{x}{\left(1 + \frac{5}{100}\right)^2} \right\}$$

$$\text{Or, } 16,400 = \frac{2.05x}{1.1025}$$

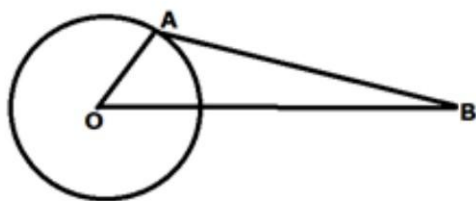
$$\text{Or, } x = (16,400/2.05) \times 1.1025$$

$$\text{So, } x = ₹8,820$$

$$\text{Therefore, each installment} = ₹8,820$$

Hence, option c.

37. **Solution: C**



Since, AB is the tangent to the circle

So,

$\angle OAB = 90^\circ$ (the tangent at any point of the circle is perpendicular to the radius through the point of contact)

In right triangle OAB, using Pythagoras theorem

$$AB^2 = OB^2 - OA^2$$

$$\text{Or, } AB^2 = (18)^2 - (12)^2$$

$$\text{Or, } AB^2 = 324 - 144$$

$$\text{Or, } AB^2 = 180$$

$$\text{So, } AB = 6\sqrt{5}$$

So, length of tangent is $6\sqrt{5}$ cm because length cannot be negative.

Hence, option c.

38. **Solution: B**

Required profit percentage =

$$\left(\frac{634 - 600}{600} \right) \times 100 = \left(\frac{34}{600} \right) \times 100 \sim 5.67\%$$

Hence, option b.

39. **Solution: C**

Let the cost price of article be ₹100x.

So, marked price of article = 130% of 100 = 1.3 × 100x = ₹130x

Selling price of article = 100x × 1.17 = ₹117x

So, discount percentage = $\left(\frac{130x - 117x}{130x} \right) \times 100 = 10\%$

Hence, option c.

40. **Solution: C**

Prime numbers up to 20 = 2, 3, 5, 7, 11, 13, 17, 19

Required probability = $(8/20) = (2/5)$

Hence, option c.

41. **Solution: A**

Let the efficiency of each worker be 'y' units/day.

Total work = 75 × 40 × y = 3,000y units

Let 'N' number of workers have left the work before the completion of work.

ATQ:

We have, $3,000y = (75 \times 25 \times y) + (75 - N) \times (40 - 25 + 22.5) \times y$

$$\text{Or } 3,000y = 1,875y + (75 - N) \times 37.5y$$

$$\text{Or, } 1,125y = 2,812.5y - 37.5Ny$$

$$\text{Or, } 37.5Ny = 1,687.5y$$

$$\text{Or, 'N' } = (1,687.5y/37.5y)$$

$$\text{Or, 'N' } = 45$$

Hence, option a.

42. **Solution: D**

Required number of people = $(28 + 14 + 25) \% \times 72,000 = (0.67) \times 72,000 = 48,240$

Hence, option d.

43. **Solution: B**

$$\sqrt{(\tan 45^\circ + \operatorname{cosec} 30^\circ)^3 - (\sec 60^\circ + \cot 45^\circ)^2 - 4 \sin^2 45^\circ}$$

$$= \sqrt{(1 + 2)^3 - (2 + 1)^2 - 4 \left(\frac{1}{\sqrt{2}} \right)^2}$$

$$= \sqrt{(3)^3 - (3)^2 - 4 \times \left(\frac{1}{2} \right)}$$

$$= \sqrt{27 - 9 - 2} = \sqrt{16} = 4$$

Hence, option b.

44. **Solution: C**

Sum of marks scored by 'A', 'C' and 'F' = 150 + 152 + 188 = 490

Sum of marks scored by 'B', 'D' and 'E' = 178 + 138 + 162 = 478

Required percentage = $(490/478) \times 100 = 102.51\%$

Hence, option c.

45.

Solution: D

Sum of all three angles of a triangle is 180°

For option 'A':

$$60^\circ + 70^\circ + 40^\circ = 170^\circ$$

For option 'B':

$$50^\circ + 60^\circ + 60^\circ = 170^\circ$$

For option 'C':

$$60^\circ + 65^\circ + 75^\circ = 200^\circ$$

For option 'D':

$$50^\circ + 70^\circ + 60^\circ = 180^\circ$$

Hence, option d.

46.

Solution: C

Length of the room = $250 \div 100 = 2.5$ metres

Breadth of the room = $200 \div 100 = 2$ metres

And height of the room = $150 \div 100 = 1.5$ metres

Area of the entire room = $2 \times \{(2.5 \times 2) + (2 \times 1.5) + (1.5 \times 2.5)\} = 2 \times (5 + 3 + 3.75) = 23.5 \text{ m}^2$

Area of the floor = $2 \times 2.5 = 5 \text{ m}^2$

Area to be painted = area of entire room - area of the floor

So, required cost = $50 \times (23.5 - 5) = ₹925$

Hence, option c.

47.

Solution: A

$$\begin{aligned} & \sqrt{\frac{\sec A + 1}{\sec A - 1}} + \sqrt{\frac{\sec A - 1}{\sec A + 1}} \\ &= \sqrt{\frac{(\sec A + 1) \times (\sec A + 1)}{(\sec A - 1) \times (\sec A + 1)}} + \sqrt{\frac{(\sec A - 1) \times (\sec A - 1)}{(\sec A + 1) \times (\sec A - 1)}} \\ &= \sqrt{\frac{(\sec A + 1)^2}{\sec^2 A - 1}} + \sqrt{\frac{(\sec A - 1)^2}{\sec^2 A - 1}} \\ &= \frac{\sec A + 1}{\sqrt{\tan^2 A}} + \frac{\sec A - 1}{\sqrt{\tan^2 A}} \\ &= \frac{\sec A + 1 + \sec A - 1}{\tan A} \\ &= \frac{2 \sec A}{\tan A} \\ &= \frac{\cos A}{\sin A} \\ &= \frac{\cos A}{\sin A} \\ &= \frac{1}{\sin A} \\ &= 2 \operatorname{cosec} A \end{aligned}$$

Hence, option a.

48.

Solution: D

$$\text{Given, } y - \frac{1}{y} = 6\sqrt{7}$$

Squaring both sides we get

$$y^2 + \frac{1}{y^2} - 2 = 252$$

$$y^2 + \frac{1}{y^2} = 254$$

$$\text{Now, } \left(y + \frac{1}{y} \right)^2 = y^2 + \frac{1}{y^2} + 2 = 254 + 2 = 256$$

$$y + \frac{1}{y} = 16$$

$$\text{Now, } y^3 + \frac{1}{y^3} = \left(y + \frac{1}{y} \right)^3 - 3 \left(y + \frac{1}{y} \right)$$

$$y^3 + \frac{1}{y^3} = 16^3 - 3 \times 16 = 4096 - 48 = 4048$$

Alternate Solution

$$\text{Given } \{y - (1/y)\} = 6\sqrt{7}$$

$$\text{If, } \{a - (1/a)\} = k, \text{ then } \{a + (1/a)\} = \sqrt{k^2 + 4}$$

$$\text{So, } \{y + (1/y)\} = \sqrt{(6\sqrt{7})^2 + 4} = \sqrt{252 + 4}$$

$$\text{Or, } \{y + (1/y)\} = \sqrt{256}$$

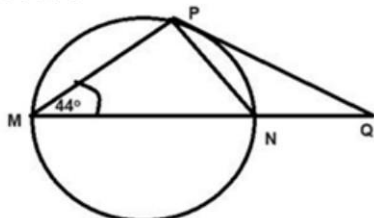
$$\text{So, } \{y + (1/y)\} = 16$$

If, $\{a + (1/a)\} = k$, then, $\{a^3 + (1/a^3)\} = k^3 - 3 \times k$
 So, $\{y^3 + (1/y^3)\} = 16^3 - 3 \times 16 = 4096 - 48 = 4,048$
 Hence, option d.

49. **Solution: D**

Mean proportion of two numbers 'a' and 'b' is $\sqrt{ab}$
 So, $'X' = \sqrt{6.4 \times 129.6} = 28.8$
 Third proportion of two numbers 'a' and 'b' is (b^2/a)
 So, $'Y' = \{(28.8 \times 28.8) / 19.2\} = 43.2$
 Required value = $(2 \times 28.8) : 43.2 = 4:3$
 Hence, option d.

50. **Solution: C**



Angle made by the diameter of a circle on the arc of the circle is 90° i.e. $\angle MPN = 90^\circ$.

Sum of each angle in a triangle is 180° .

So, $\angle PMN + \angle PNM + \angle MPN = 180^\circ$

Or, $44^\circ + \angle PNM + 90^\circ = 180^\circ$

Or, $\angle PNM = 180^\circ - 134^\circ$

Or, $\angle PNM = 46^\circ$

Hence, option c.

General Awareness

51. **Solution: A**

Prime Minister Narendra Modi has flagged off India's first indigenously built hydrogen fuel cell ferry boat in virtual mode. The vessel, manufactured by **Cochin Shipyard Limited (CSL)**, will be deployed for service at Varanasi in Uttar Pradesh.

Features of the vessel:

- The Hydrogen fuel cell vessel is a 24-meter-long catamaran, which can carry 50 people in its air-conditioned passenger area.
- This boat has five hydrogen cylinders that can carry 40 kg of hydrogen and support eight hours of operations.
- The vessel is fitted with a 3-kW solar panel.
- The vessel has zero emission, zero noise and is energy-efficient, which makes it more environmentally friendly.
- This vessel uses a 50-kW PEM (proton-exchange membrane) fuel cell, with Lithium-Ion Phosphate batteries.

Hence, Option A is the correct answer.

52. **Solution: C**

The **Rig Veda** is divided into 10 books or mandalas.

- It has **1028** hymns written by a number of priestly families.
- The Rig Veda was written when Aryans were still in Punjab.

Hence, Option C is the correct answer.

53. **Solution: B**

Lindane, also known as gamma-hexachlorocyclohexane, **gammexene**, and benzene hexachloride.

It is used as an agricultural insecticide and as pharmaceutical treatment for lice and scabies.

Hence, Option B is the correct answer.

54. **Solution: B**

The book titled "The Great Flap of 1942: How the Raj Panicked over a Japanese Non-invasion" has been authored by **Mukund Padmanabhan**. This is his first book.

• The book is published by **Vintage Books**.

• Mukund Padmanabhan is the former Editor of The Hindu, one of India's largest and most respected newspapers.

Hence, Option B is the correct answer.

55. **Solution: C**

Jain Councils:

The first council was held at **Pataliputra** (Bihar) by Sthulbhadra, in the beginning of the 3rd century BC and resulted in the compilation of 12 Angas to replace 14 Purvas.

Hence, Option C is the correct answer.

56. **Solution: B**

Siddhartha Gautama, most commonly referred to as the **Buddha** was a wandering ascetic and religious teacher who lived in South Asia and founded **Buddhism**.

• According to Buddhist legends, he was born in **Lumbini**, in what is now Nepal, to royal parents of the Shakya clan.

• After leading a life of mendicancy, asceticism, and meditation, he attained nirvana at Bodh Gaya in what is now India.

• The Buddha then wandered through the lower Indo-Gangetic Plain, teaching and building a monastic order.

• He died in Kushinagar, reaching parinirvana, final extinction.

Hence, Option B is the correct answer.

57. **Solution: B**

The coins of the **Mauryan Empire** were called **Pana**, and it was made up of silver and copper.

The Mauryan Empire, which formed around 321 B.C.E. and ended in 185 B.C.E., was the first pan-Indian empire, an empire that covered most of the Indian region.

Hence, Option B is the correct answer.

58. **Solution: B**

Density is defined as mass per unit volume.

Density, $\rho = \text{Mass} / \text{Volume} = M/V$

Its SI unit is **kg/m³**.

Hence, Option B is the correct answer.

59. **Solution: B**

Great Bear Lake is a lake in the boreal forest of **Canada**. It is the largest lake entirely in Canada.

The lake is in the Northwest Territories, on the Arctic Circle between 65 and 67 degrees of northern latitude and between 118 and 123 degrees western longitude, 156 m (512 ft) above sea level.

Hence, Option B is the correct answer.

60. **Solution: B**

The highest point in the **Andes Mountains** is Mount **Aconcagua**, located in the Southern Andes Mountains.

It is the highest mountain in the Americas, the highest outside Asia, and the highest in both the Western Hemisphere and the Southern Hemisphere with a summit elevation of 6,961 metres (22,838 ft).

It lies 112 kilometres (70 miles) northwest of the provincial capital, the city of Mendoza, about five kilometres (three miles) from San Juan Province, and 15 km (9 mi) from Argentina's border with Chile.

The mountain is one of the Seven Summits of the seven continents.

Hence, Option B is the correct answer.

61. **Solution: B**

The Government of India officially notified the **Citizenship (Amendment) Rules, 2024**.

· The rules, in line with the 2019 amendment to The Citizenship Act, 1955, aim to provide citizenship to migrants belonging to Hindu, Sikh, Buddhist, Jain, Parsi, or Christian communities who entered India before December 31, 2014, from Pakistan, Afghanistan, or Bangladesh.

· The Ministry of Home Affairs (MHA) has assigned the task of processing citizenship applications under the CAA.

· Eligible applicants include individuals of Indian origin, spouses of Indian citizens, minor children of Indian citizens, individuals with registered Indian citizen parents, and Overseas Citizens of India Cardholders, among others.

· Autonomous councils created under the 6th Schedule of the Constitution are **exempted** from the purview of CAA. The law therefore, not be implemented in most tribal parts of Northeastern states.

· Autonomous councils under this special status include Karbi Anglong, Dima Hasao and Bodoland Territorial Council areas in Assam, Garo Hills in Meghalaya, and tribal areas in Tripura.

· **Areas where the Inner Line Permit (ILP)** is required for a visit by people from other parts of the country in Northeastern states are excluded from the law. The ILP is in place in parts of Arunachal Pradesh, Nagaland, Mizoram and Manipur.

Hence, Option B is the correct answer.

62. **Solution: B**

Kumarapala was an Indian king from the **Chaulukya** (Solanki) dynasty of Gujarat.

He ruled present-day Gujarat and surrounding areas, from his capital **Anahilapataka**.

Kumarapala was a descendant of the Chaulukya king Bhima I.

Kumarapala is the subject of several major chronicles by medieval Jain scholars. These scholars include Hemachandra (Dvyashraya and Mahaviracharita), Prabhachandra, Somaprabha (Kumarapala-Pratibodha), Merutunga (Prabandha-Chintamani), Jayasimha Suri, and Jina-Mandana Suri, among others. Of all the Indian kings, the largest number of chronicles have been written about Kumarapala.

Hence, option B is the correct answer.

63. **Solution: A**

Borrowed Features of the Constitution of India:

· From USSR: Fundamental Duties and Five-Year Plan.

· From Germany: **Emergency provisions**.

· From Japan: Procedure established by law.

· From Canada: Federal system and Residuary powers.

· From South Africa: Procedure of Constitutional Amendment.

· From Ireland: Concept of Directive Principles of State Policy (originally, it was borrowed from Spain).

Hence, option A is the correct answer.

64. **Solution: B**

Article 17 in Constitution of India: Abolition of untouchability

"Untouchability" is abolished and its practice in any form is forbidden. The enforcement of any disability arising out of "Untouchability" shall be an offence punishable in accordance with law.

Hence, option B is the correct answer.

65. **Solution: C**

Federal features of Indian constitution:

· Division of Powers

· Written Constitution

· Supreme judiciary

· **Bi-cameral legislation**

Unitary or Non-Federal Features:

· Single Constitution

· Centre's control over States

· Rajya Sabha does not represent the States equality

· Existence of States depends on the Centre

· Single citizenship

· Unified judiciary

· Proclamation of emergency

Hence, Option C is the correct answer.

66. **Solution: B**

Cyanobacteria are a phylum of autotrophic gram-negative bacteria that can obtain biological energy via photosynthesis.

Cyanobacteria are commonly known as **blue-green algae**, although they are not scientifically classified as algae.

They appear to have originated in a freshwater or terrestrial environment.

Hence, Option B is the correct answer.

67. **Solution: B**

Noted writer **Usha Kiran Khan** has passed away in **Patna, Bihar**. She was a great writer who wrote several novels in **Hindi and Maithili** languages.

She won a **Sahitya Akademi Award** for the Maithili novel 'Bhamati: Ek Avismaraniya Premkatha' in **2011**.

She was awarded a Kusumanjali Sahitya Samman by the Indian Council for Cultural Relations for her novel 'Sirjanhaar' in 2012.

She was awarded the **Padma Shri in 2015** for her service in the field of literature and education.

Hence, Option B is the correct answer.

68. **Solution: D**

Part IV of the Constitution of India (Article 36 - 51) contains the Directive Principles of State Policy (DPSP).

The concept of DPSP emerged from Article 45 of the Irish Constitution.

Hence, Option D is the correct answer.

69. **Solution: B**

The Tsugaru Strait is a strait between Honshu and Hokkaido in northern **Japan** connecting the Sea of Japan with the **Pacific Ocean**. It was named after the western part of Aomori Prefecture.

Hence, Option B is the correct answer.

70. **Solution: C**

The Preamble means introduction or preface of the Constitution or essence of the Constitution.

Terms mentioned in the Preamble of India:

· **Justice**, social, economic, and political.

· **Liberty** of thought, expression, belief, faith, and worship.

· **Equality** of status and of opportunity and to promote among them all.

· **Fraternity** assuring the dignity of the individual and the unity and integrity of the nation.

Hence, Option C is the correct answer.

71. **Solution: B**
The "**law of multiple proportions**" states that if two elements form more than one compound, then the ratios of the masses of the second element which combine with a fixed mass of the first element will always be ratios of small whole numbers.
This law is also known as Dalton's Law, named after **John Dalton**, the chemist who first expressed it.
Hence, Option B is the correct answer.
72. **Solution: C**
Sovereign Gold Bond (SGB) Scheme:
SGBs are government securities denominated in grams of gold. They are substitutes for holding physical gold. Investors have to pay the issue price in cash and the bonds will be redeemed in cash on maturity. The Bond is issued by Reserve Bank on behalf of Government of India.
The Bonds are issued in denominations of one gram of gold and in multiples thereof.
Minimum investment in the Bond shall be **one gram** with a maximum limit of subscription of **4 kg** for individuals, 4 kg for Hindu Undivided Family (HUF) and 20 kg for trusts and similar entities notified by the government from time to time per fiscal year (April - March).
Hence, Option C is the correct answer.
73. **Solution: B**
Mars is the fourth nearest planet to the Sun. It is also known as **Red Planet** because it appears as a reddish ball when looked at through a telescope.
Its revolution period is 687 days and rotation period are of 24.6 hours (almost equal to that of Earth), it has two satellites Phobos and Deimos and it has signs of water, hence, there is a possibility of life.
Hence, option B is the correct answer.
74. **Solution: D**
Antony Van Leeuwenhoek is universally acknowledged as the **father of microbiology**. He discovered both protists and **bacteria**.
Bacteria are ubiquitous, mostly free-living organisms often consisting of one biological cell. They constitute a large domain of prokaryotic microorganisms.
Hence, option D is the correct answer.
75. **Solution: C**
The Planning **Commission** was set-up on 15th March 1950 under the Chairmanship of Jawaharlal Nehru.
It was to formulate plans for the economic development of the country on the basis of the available physical, capital and human resources. It was a non-statutory and non-constitutional advisory body.
On 1st January 2015, Government of India established **NITI Aayog** (National Institution for Transforming India Aayog) to replace planning commission.
Hence, option C is the correct answer.

English Language

76. **Solution: B**
A person who can speak two languages fluently is called "bilingual." Thus, B is the right answer.
Multilingual: able to speak several different languages.
Polyglot: a person who knows and is able to use several languages.

- Linguist: a person skilled in foreign languages or linguistics.
77. **Solution: A**
In this context, "bear" refers to endure or tolerate and should be used in the sentence. The sentence tells us how he was unable to endure the thought of losing his pet cat. Thus, A is the right answer.
The other options are incorrect in the given context:
Bar: forbid; disallow.
Bare: uncovered or naked.
Bair: not a valid word.
Beer: an alcoholic beverage.
78. **Solution: B**
Option B is the right answer.
The sentence is in direct speech and in the indicative mood. To convert this sentence to the indirect speech, follow these rules:
I. Remove the comma and the inverted commas.
II. Begin the indirect speech sentence with the reporting speech clause JACK SAID.
III. Put THAT between the reporting and reported speeches.
IV. Change the present simple tense SINGS to the past simple tense SANG.
V. The first person possessive pronoun MY will change to the third person HIS.
79. **Solution: C**
QSPR is the correct sequence. Q introduces the topic - photosynthesis as a vital biological process in plants. S provides additional information on the crucial role of photosynthesis in producing oxygen and food. P follows by summarizing the process as involving a series of chemical reactions. R ends by describing the chemical reactions involved in the process. Thus, C is the right answer.
80. **Solution: B**
The sentence must use 'simple past tense' in order to maintain parallelism with the rest of the sentence. Thus, B is the right answer.
This makes the highlighted phrase, 1, 3 and 4 incorrect.
81. **Solution: B**
The word "ubiquitous" means present, appearing, or found everywhere. A synonym for "ubiquitous" is "pervasive," which also means spreading widely throughout an area or a group of people. Thus, B is the right answer.
Rare - uncommon. Scarce - less; scant. Limited - less in number.
82. **Solution: C**
In the sentence, SERIOUSNESS (the quality of being SERIOUS) should be used instead of SERIOUS (severe in effect) to act as the object of the preposition OF. SERIOUS is an adjective that describes or modifies a NOUN directly, we need SERIOUSNESS to describe the quality of approach (SENSE).
The corrected sentence is: "Watching my parents has taught me to approach work with a sense of seriousness and dedication."
Thus, C is the right answer.
83. **Solution: A**
A thing that is kept as a reminder of a person, place, or event is called SOUVENIR. Thus, A is the right answer.
The other words have different meanings:
Potable - safe to drink.

- Pedantic - excessively concerned with minor details or rules.
Inevitable - certain to happen.
84. **Solution: D**
The idiom ASSUMING AIRS means to act with superiority. Thus, D is the right answer.
The other idioms have different meanings:
Roll up his sleeves - to prepare for hard work.
Open the floodgates - to make it possible for something to happen in great numbers.
Over the top - too extreme and not suitable.
85. **Solution: A**
We need a noun to be modified by the adjective SINGLE. The correct word to use in this context is "file," which means a line or row of people or things. Thus, A is the right answer.
The other options do not make sense in this context:
Phial: a small bottle, typically one made of glass, used especially for holding liquids.
Vile: extremely unpleasant.
Fyle: not a valid word.
86. **Solution: B**
The word ADHARENT is incorrectly spelled. The correct spelling of the word is ADHERENT (supporting a particular person or idea). Thus, B is the right answer.
The other options are correctly spelled:
Turncoat - a person whose support changes from one side to its opposite.
Glimmer - to shine faintly.
Traitor - a person who gives away or sells secrets of his or her country.
87. **Solution: B**
ENORMOUS means extremely large. MASSIVE (very large and heavy) will be its synonym. Thus, B is the right answer.
Tiny - very small. Minute - extremely small. Minimal - the smallest possible amount.
88. **Solution: A**
INQUISITIVENESS means the quality of being curious. The sentence suggests that the subject's parents were always supportive of her curious nature. INDIFFERENCE (the quality of not being interested in someone or something) is its antonym. Thus, A is the right answer.
Madness- extreme foolishness. Boldness- willingness to take risks. Laziness- state of being unwilling to work.
89. **Solution: C**
The word IMPLEMENTATION means the process of putting a plan, method, or policy for doing something into effect. EXECUTION (to put completely into effect) will be the synonym of the given word. Thus, C is the right answer.
The other options have different meanings:
Operate (verb) - to control the functioning of a machine, process, or system.
Administer (verb) - to manage and be responsible for the running of a business, organisation, etc.
Management (noun) - the control and organisation of something.
90. **Solution: C**
The idiom HIT THE SACK means to go to bed; go to sleep. Thus, C is the right answer.
The other options do not provide the correct meaning of the given idiom.
91. **Solution: A**

- GRACEFUL means having or showing grace and elegance. CLUMSY (awkward in movement) will be its antonym. Thus, A is the right answer.
Elegant - stylish; sophisticated. Honest - truthful. Swift - quick.
92. **Solution: D**
CABD is the correct sequence of sentences. C sets the scene by describing the past scenario of bookstores. A proceeds by telling us how this scenario has changed now and the popularity of e-books has surpassed that of printed books. B continues by explaining the struggle of bookstores to adapt to this change. D ends by explaining the rise of online retailers and its impact on accelerating this trend. Thus, D is the right answer.
93. **Solution: B**
The sentence is in the indicative mood, simple future tense, and active voice. To change the sentence to passive voice, follow the rules below:
I. The subject clause will become the object clause. The subject in the sentence, MRS. SMITH, will change to the object of the verb, the preposition BY will be added before it. The object, FRENCH, will become the subject and begin the sentence.
II. Replace the verb WILL TEACH with WILL BE TAUGHT so that it fits in the simple future tense passive voice structure - Subject + Will + Be + Verb + By + Object.
Thus, B is the right answer.
94. **Solution: A**
In A, replace the comparative degree adjective WORSE with the superlative degree WORST as the sentence tells us of the most extreme case of food deprivation since the Second World War. Thus, A is the right answer.
95. **Solution: D**
A person fond of delicious food is called EPICURE. Thus, D is the right answer.
Cannibal- One who feeds on human flesh. Fatalist- One who believes in fate. Lunatic-
96. **Solution: D**
We need the present participle form of a verb to fit in the past continuous tense construction WERE + VERB. The sentence seeks to convey that half of the world's poorest nations were witnessing a growing income disparity. EXPERIENCING (witnessing) will fit here. Thus, D is the right answer.
The other options are contextually incorrect:
Tramping - walking heavily or noisily.
Mixing - combining or putting together.
Delighting - giving someone great pleasure or satisfaction.
97. **Solution: B**
We need a noun to be modified by an indefinite article AN. The sentence seeks to convey that the IMF now thinks that low-income countries will grow by 4.7% in 2024, which is a little less than what it calculated in January. ESTIMATE (a guess of what the size, value, amount, cost, etc. of something might be) will fit here. Thus, B is the right answer.
The other options are contextually incorrect:
Assess (verb) - the action making a judgement about something.
Apathy - lack of feeling or emotion.
Penalty - a punishment imposed for breaking a law.
98. **Solution: C**

We need the present participle form of a verb to fit in the present continuous tense construction ARE + VERB. The sentence seeks to convey that countries are still struggling with the effects of the Covid-19 pandemic and other unexpected events. GRAPPLING (struggling) will fit here. Thus, C is the right answer. The other options are either grammatically or contextually incorrect:

Conducting - organising and carrying out.

Suffer (base form verb) - to tolerate.

Complicating - making something difficult or complex.

99. **Solution: A**

We need a preposition that is suitable for specific days, dates and months. ON will fit here. Thus, A is the right answer.

The other options are grammatically incorrect:

We use AT for precise times, holidays and events, e.g. at 4 pm. FOR is used with a period of time in the

past, present or future, e.g. for five years. SINCE is used for a particular point of time, e.g. since 3rd August.

100. **Solution: B**

The sentence talks about an event that happened in the past; therefore, we need the past tense form of a verb to come after the subject, SHAREHOLDERS. The sentence seeks to convey that shareholders of the International Monetary Fund showed consensus in recognising the importance of helping poor countries with their debt burdens. AGREED (showed consensus) will fit here. Thus, B is the right answer.

The other options are contextually incorrect:

Sustained - continued for a long time.

Provided - gave someone something that they need.

Copied - made a similar or identical version of something.

SCHOLARS ACADEMY