

RRB NTPC Memory Based Model Paper Based on Jan 20 Exam



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Logical Reasoning

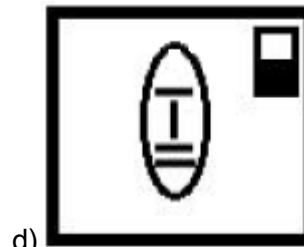
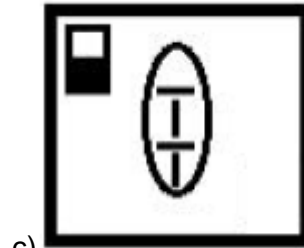
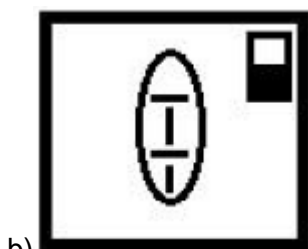
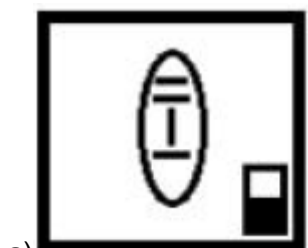
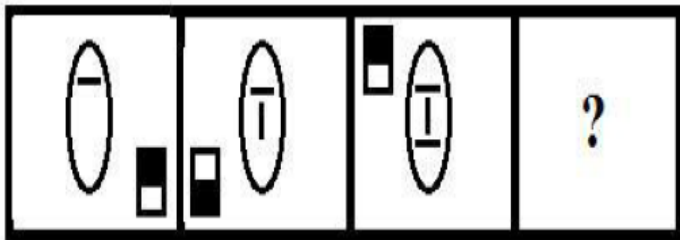
1. Three of the four words are related in a certain way and one is different. Select the odd one out.

- a) Africa
- b) Europe
- c) North America
- d) South Africa

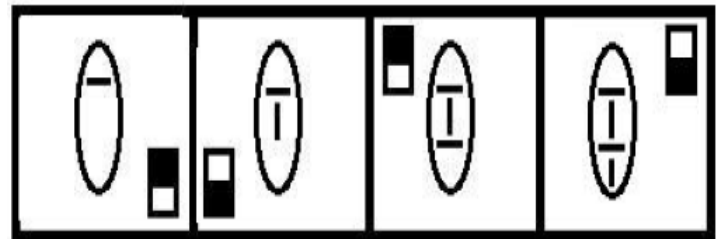
Answer: D

All options except 'South Africa' are name of continents.

2. Select the figure that will come next in the following figure series.



Answer: B



3. Given below are four jumbled sentences. Out of the given options pick the one that gives their correct order.

1. We all possess certain personality traits that set us apart from the rest,

A. One such research study suggests that we can change our traits provided.

B. While the most common belief is that these traits remain fixed.

C. These traits, a mix of good and bad, define how we respond to situations and people.

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D. Research studies show otherwise.

6. We want to change them.

- a) DBCA
- b) DCBA
- c) BCDA
- d) BDCA

Answer: B

1. We all possess certain personality traits that set us apart from the rest,

D. Research studies show otherwise.

C. These traits, a mix of good and bad, define how we respond to situations and people.

B. While the most common belief is that these traits remain fixed.

A. One such research study suggests that we can change our traits provided.

6. We want to change them.

4. Select the option that will replace the '?' in the given series.

5, 3, 3, 5, 15, ?

- a) 69
- b) 75
- c) 45
- d) 113

Answer: A

$$5 \times 1 - 2 = 3$$

$$3 \times 2 - 3 = 3$$

$$3 \times 3 - 4 = 5$$

$$5 \times 4 - 5 = 15$$

$$15 \times 5 - 6 = \mathbf{69}$$

5. Which two numbers should be interchanged in the following equation to make it correct?

$$6 + 28 \div 4 - 2 \times 17 = 12$$

- a) 28 and 17
- b) 17 and 6
- c) 6 and 4
- d) 28 and 2

Answer: B

$$6 + 28 \div 4 - 2 \times 17 = 12$$

b) 17 and 6

$$17 + 28 \div 4 - 2 \times 6 = 12$$

$$\Rightarrow 17 + 7 - 12 = 12$$

$$\Rightarrow 24 - 12 = 12$$

$$\Rightarrow 12 = 12$$

6. Select the word-pair in which the two words are related in the same way as are the words in the following word-pair.

Diabetes : Disease

- a) Coffee : Drink
- b) Office : Hospital
- c) Rabi : Crop
- d) Season : Summer

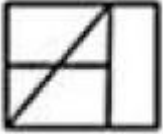
Answer: A

Diabetes is the name of a disease.

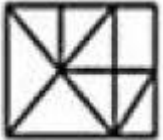
Coffee is the name of a drink.

7. Select the option in which the given figure is embedded when rotation is not allowed.

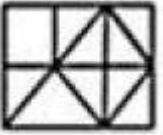
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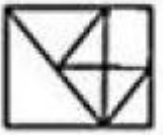
a)



b)



c)



d)

Answer: C



8. Which two signs and two numbers should be interchanged to make the given equation correct?

$$16 + 8 \times 25 - 15 \div 5 = 405$$

- a) \times and \div ; 16 and 15
- b) \times and $+$; 16 and 15
- c) \div and $-$; 8 and 25
- d) \times and $+$; 8 and 25

Answer: D

$$16 + 8 \times 25 - 15 \div 5 = 405$$

- d) \times and $+$; 8 and 25

$$16 \times 25 + 8 - 15 \div 5 = 405$$

$$\Rightarrow 400 + 8 - 3 = 405$$

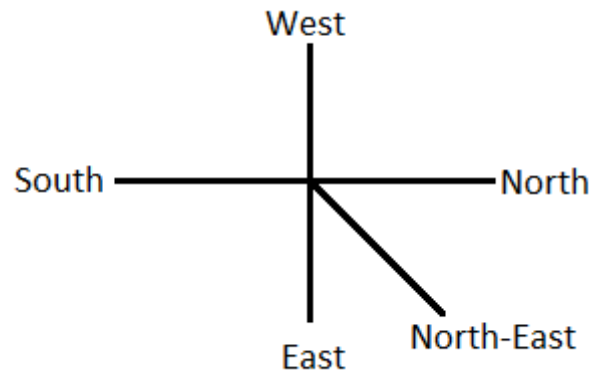
$$\Rightarrow 408 - 3 = 405$$

$$\Rightarrow 405 = 405$$

9. If East becomes North and West becomes South, then what will South-East become?

- a) North-West
- b) South-West
- c) North-East
- d) West

Answer: C



10. If SOME = 68, LOT = 56, then GIVE = ?

- a) 47
- b) 59
- c) 45
- d) 50

Answer: B

$$\text{SOME} \rightarrow (19 + 15 + 13 + 5) + (\text{Number of letters})^2 = 52 + 16 = 68$$

$$\text{LOT} \rightarrow (12 + 15 + 20) + (\text{Number of letters})^2 = 47 + 9 = 56$$

Similarly,

$$\text{GIVE} \rightarrow (7 + 9 + 22 + 5) + (\text{Number of letters})^2 = 43 + 16 = 59$$

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11. In this question, two statements are given followed by two conclusions. Choose the Conclusion (s) which best fit(s) logically.

Statements:

Some boss is arrogant

Some boss is male

Conclusions:

I. No male is arrogant

II. Some arrogant is boss

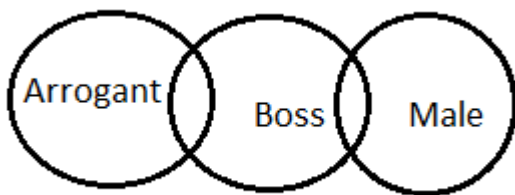
a) Only conclusion II follows

b) Both conclusions I and II follow

c) Only conclusion I follows

d) None of the conclusion follows

Answer: A



I. No male is arrogant - False

II. Some arrogant is boss - True

Only conclusion II follows.

12. Which letter cluster will replace the '?' in the following series.

LBC, NDE, MEF, OGH, ?

a) QHI

b) PIJ

c) QIJ

d) PHI

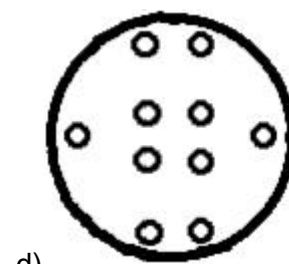
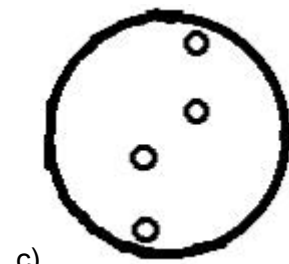
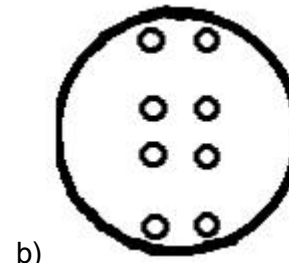
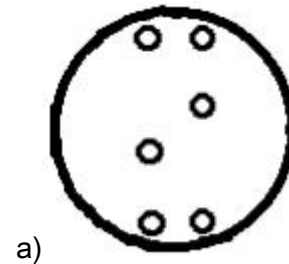
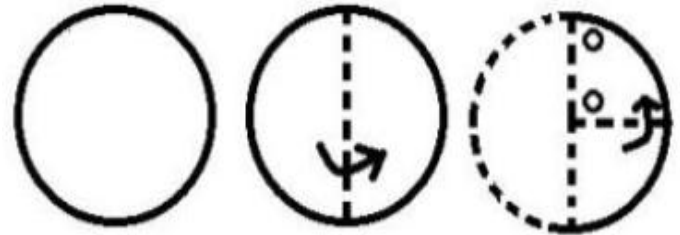
Answer: D

$L + 2 = N$; $N + 1 = M$; $M + 2 = O$; $O + 1 = P$

$B + 2 = D$; $D + 1 = E$; $E + 2 = G$; $G + 1 = H$

$C + 2 = E$; $E + 1 = F$; $F + 2 = H$; $H + 1 = I$

13. A paper is folded and cut as shown below. How will the paper appear when unfolded?



Answer: B

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14. Three of the following pairs are alike in a certain way and one is different. Find the odd one out.

- a) 818 – 489
- b) 657 – 328
- c) 434 - 115
- d) 972 – 643

Answer: C

- a) 818 – 489 → Difference is 329
- b) 657 – 328 → Difference is 329
- c) 434 – 115 → Difference is 319**
- d) 972 – 643 → Difference is 329

15. In the question given below, one statement is followed by two assumptions. You have to decide which of the following assumptions are strong.

Statement:

Should children be allowed to drink coke?

Assumptions:

I. Yes, coke is an energetic product and children also like it too much.

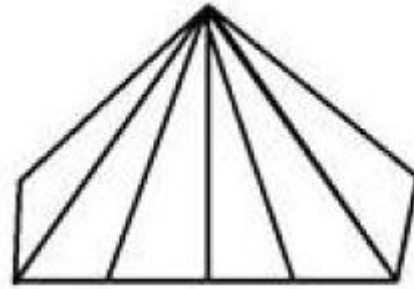
II. No, drinks filled with any gas have not enough nutrients for the development of children.

- a) Only assumption I is strong.
- b) Only assumption II is strong.
- c) I and II both assumptions are strong.
- d) Neither assumption I nor II is strong.

Answer: B

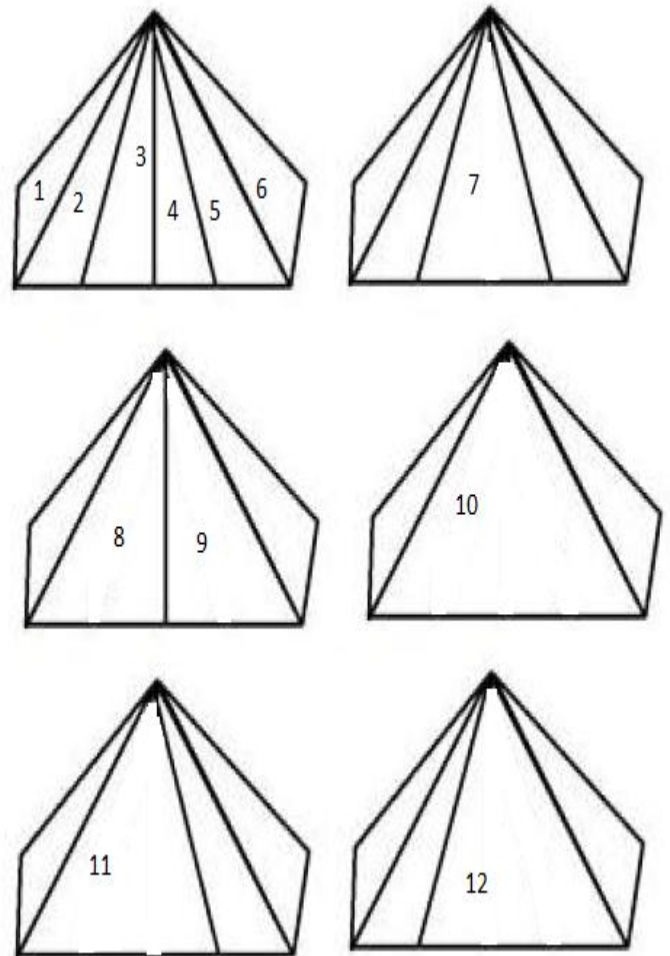
Only assumption II is strong.

16. How many triangles are there in the given figure?



- a) 10
- b) 11
- c) 12
- d) 13

Answer: C



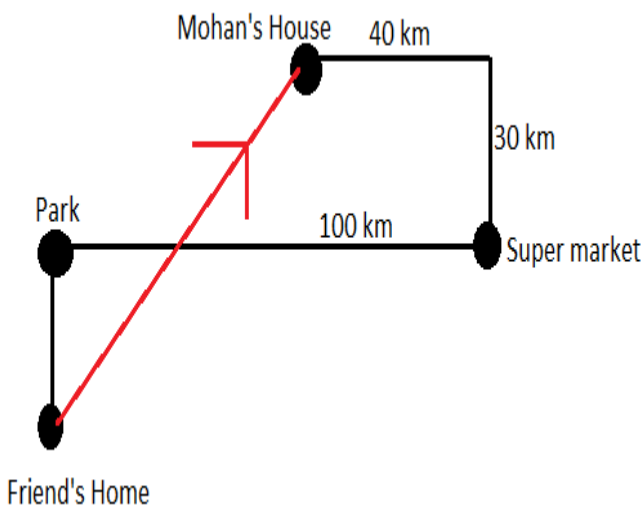
17. Mohan walked 40 km towards east from his house, and then took a right turn and walked 30 km

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to reach the super market. From there he took a right turn again and walked 100 km to reach the park, from where he took a left turn and walked a few kilometres to reach his friends home. In which direction his Mohan's house from his friends home?

- a) South-West
- b) South-East
- c) North-East
- d) North-West

Answer: C



18. Find the wrong term in the given series.

S, U, X, A, G, M

- a) U
- b) A
- c) M
- d) S

Answer: B

$S + 2 = U$; $U + 3 = X$; $X + 4 = B \neq A$; $B + 5 = G$; $G + 6 = M$

19. In this question, two statements are given followed by two conclusions. Choose the Conclusion (s) which best fit(s) logically.

Statements:

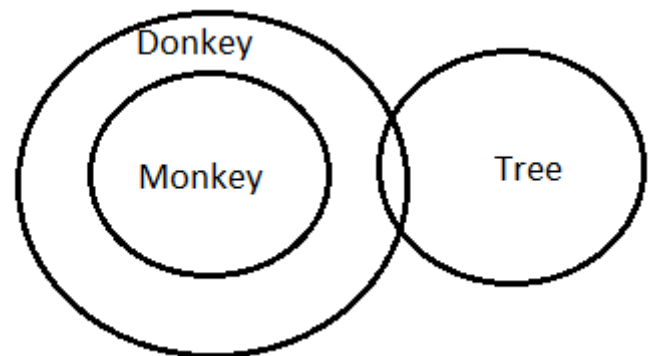
- All monkey are donkey.
- Some tree are donkey.

Conclusions:

- I. Some tree are monkey.
- II. Some donkey are tree.

- a) Only conclusion II follows
- b) Both conclusions I and II follow
- c) Only conclusion I follows
- d) None of the conclusion follows

Answer: A



- I. Some tree are monkey. → False
 - II. Some donkey are tree. → True
- Only conclusion II follows.

20. Consider the statement and assumptions below and decide which assumption is inherent in the statement.

Statement:

A woman is crying in the hospital because her husband has been killed in an air attack in Syria.

Assumptions:

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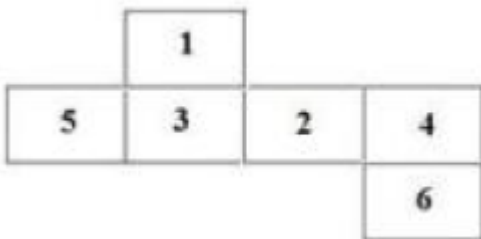
I. The wife thinks that God is not with her.
II. The woman is blaming her husband for being in Syria.

- a) Only I is inherent.
- b) Only II is inherent.
- c) Neither I nor II is inherent.
- d) Both I and II are inherent.

Answer: A

- a) Only I is inherent.

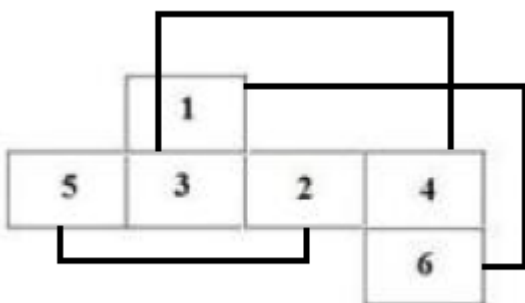
21. If the following figure is folded to form a cube, then which number will be on the face opposite to the face having number '5'?



- a) 3
- b) 4
- c) 2
- d) 1

Answer: C

Faces opposite to each other is shown below:

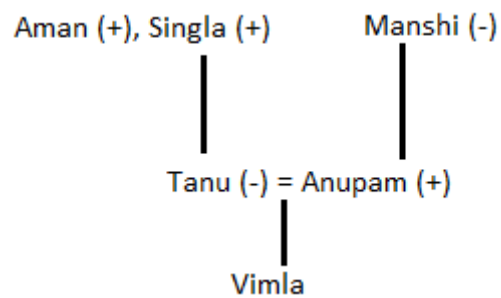


'2' is opposite to the face having number '5'.

22. Aman is brother of Singla who is grandfather of Vimla. Tanu is married to Anupam. Manshi is mother of Vimla's father Anupam. If there is only one married couple in the family, then how is Tanu related to Manshi?

- a) Mother
- b) Sister
- c) Mother-in-law
- d) Daughter-in-law

Answer: D



Tanu is daughter-in-law of Manshi.

23. Select the option that will correctly replace the Question mark (?) in the series.

Someone, Lion, Priority, Awesome, ?

- a) Commission
- b) Fission
- c) Colleague
- d) Cation

Answer: B

Someone → 'O' is at 2nd position

Lion → 'O' is at 3rd position

Priority → 'O' is at 4th position

Awesome → 'O' is at 5th position

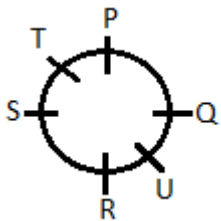
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Fission → 'O' is at 6th position

24. Six friends P, Q, R, S, T and U are sitting around circular table facing each other. P is facing R and S is facing Q. If T is sitting between P and S, then who is sitting 2nd to the right of R?

- a) Q
- b) P
- c) T
- d) S

Answer: A



Q is sitting 2nd to the right of R.

25. Select the option that is related to the third term in the same way as the second term is related to the first term.

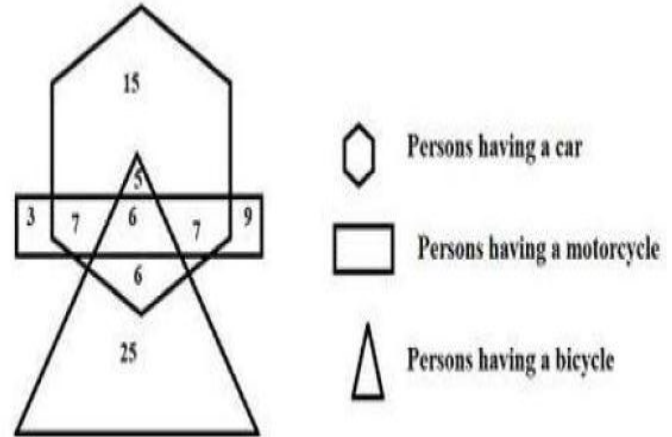
Pramod Sawant : Goa :: Pema Khandu : ?

- a) Nagaland
- b) Arunachal Pradesh
- c) Assam
- d) Mizoram

Answer: B

The Chief Minister of Goa is Pramod Sawant.
The Chief Minister of Arunachal Pradesh is Pema Khandu.

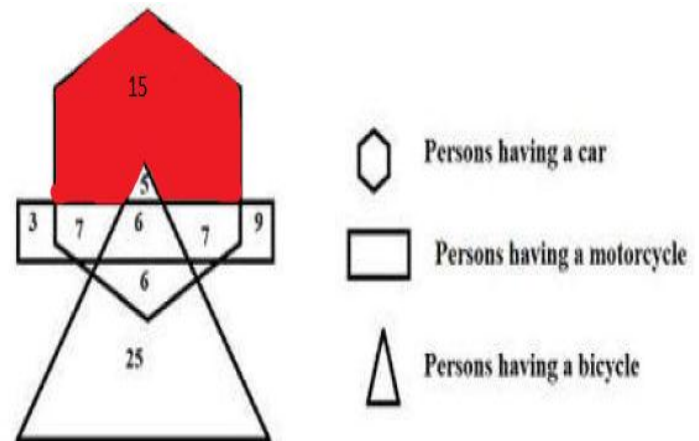
26. Study the diagram and answer the question given below.



How many persons have only car?

- a) 5
- b) 20
- c) 15
- d) 34

Answer: C



15 persons have only car.

27. In an examination, 51% students fail in English and 45% students fail in Mathematics. If 21% students fail in both the subjects, then 169 students pass the examination. Find the total number of students taking the exam?

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- a) 612
- b) 767
- c) 619
- d) 676

Answer: D

% of students who failed the exam = $51 + 45 - 21 = 75\%$

So, 25% students passed the exam.

According to question:

$\frac{25}{100} \times$ Number of students taking the exam = 169
 \Rightarrow Number of students taking the exam = $169 \times \frac{100}{25}$
 \Rightarrow Number of students taking the exam = $169 \times \frac{4}{1}$
 \Rightarrow Number of students taking the exam = **676**

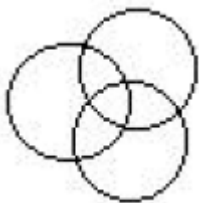
28. Select the Venn diagram that best represents the relationship among Violin, Instrument, and Barometer?



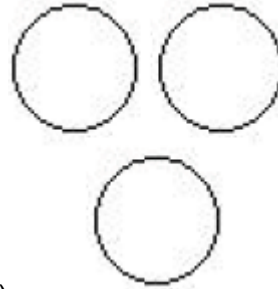
a)



b)

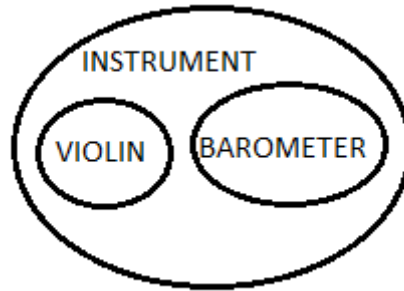


c)



d)

Answer: A



Violin is a musical instrument.

Barometer is a scientific instrument.

29. Select the correct combination of mathematical signs to replace 'A' sequentially and balance the following equation.

$$16 A 8 A 6 A 3 A 4$$

- a) $\div, +, -, =$
- b) $\div, \times, =, \times$
- c) $+, =, \div, -$
- d) $\times, +, =, \div$

Answer: B

$$16 A 8 A 6 A 3 A 4$$

$$b) \div, \times, =, \times$$

$$16 \div 8 \times 6 = 3 \times 4$$

$$\Rightarrow 2 \times 6 = 12$$

$$\Rightarrow 12 = 12$$

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30. Select the correct alternative to indicate the arrangement of the following words in a logical and meaningful order.

1. Sun
 2. Asteroid
 3. Planet
 4. Galaxy
- a) 4, 2, 1, 3
 - b) 4, 1, 2, 3
 - c) 4, 3, 1, 2
 - d) 4, 1, 3, 2

Answer: D

4. Galaxy

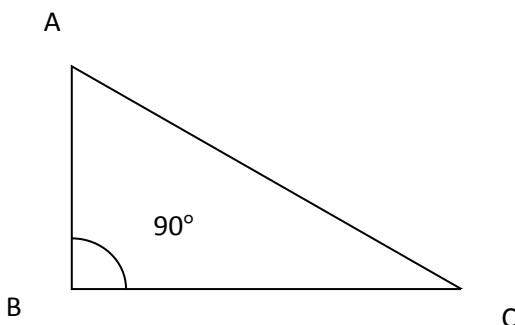
1. Sun
3. Planet
2. Asteroid

Mathematics

1. In a right-angle triangle ABC, $\tan A = \sqrt{3}$, then find the value of $\sin A \cdot \cos C + \cos C \cdot \sin A$

- a) $\sqrt{3}/4$
- b) $\sqrt{3}/2$
- c) $3/4$
- d) $3/2$

Answer: D



$$\tan A = \sqrt{3}$$

$$A = 60^\circ$$

$$\text{So, } C = 30^\circ$$

$$\sin A = \sin 60^\circ = \sqrt{3}/2$$

$$\cos C = \cos 30^\circ = \sqrt{3}/2$$

$$\sin A \cdot \cos C + \cos C \cdot \sin A$$

$$\sin 60^\circ \times \cos 30^\circ + \cos 30^\circ \times \sin 60^\circ$$

$$\sqrt{3}/2 \times \sqrt{3}/2 + \sqrt{3}/2 \times \sqrt{3}/2$$

$$= \frac{3}{4} + \frac{3}{4}$$

$$= 3/2$$

2. Find the value of $\sin 15^\circ$.

- a) $(\sqrt{3} - 1)/\sqrt{2}$
- b) $(\sqrt{3} + 1)/\sqrt{2}$
- c) $(\sqrt{3} - 1)/2\sqrt{2}$
- d) $(\sqrt{3} + 1)/2\sqrt{2}$

Answer: C

$$\sin 15^\circ = \sin (45^\circ - 30^\circ)$$

$$= \sin 45^\circ \times \cos 30^\circ - \cos 45^\circ \times \sin 30^\circ$$

$$= 1/\sqrt{2} \times \sqrt{3}/2 - 1/\sqrt{2} \times 1/2$$

$$= \sqrt{3}/2\sqrt{2} - 1/2\sqrt{2}$$

$$= (\sqrt{3} - 1)/2\sqrt{2}$$

3. Find the area and the perimeter of an equilateral triangle whose side length is 4 cm.

- a) $2\sqrt{3} \text{ cm}^2, 16 \text{ cm}$
- b) $4\sqrt{3} \text{ cm}^2, 12 \text{ cm}$
- c) $2\sqrt{3} \text{ cm}^2, 12 \text{ cm}$
- d) $4\sqrt{3} \text{ cm}^2, 16 \text{ cm}$

Answer: B

Let the length of an equilateral triangle be 'a'

$$\text{Area of an equilateral triangle} = \frac{\sqrt{3}}{4} \times a^2 = \frac{\sqrt{3}}{4} \times 4^2$$

$$= 4\sqrt{3} \text{ cm}^2$$

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Perimeter of an equilateral triangle = $3 \times a = 3 \times 4 = 12$ cm

4. Solve: $[(-1/2)^5 / (-1/2)^4] + [(-1/8) / (-1/4)]$

- a) 1
- b) 0
- c) -1
- d) 2

Answer: B

$[(-1/2)^5 / (-1/2)^4] + [(-1/8) / (-1/4)]$

$$= -1/2 + 1/2$$

$$= 0$$

5. A can do work in 4 days, B can work in 6 days and C can finish work in 10 days. In how many days they can finish 50% of the work.

- a) 6 days
- b) 4 days
- c) 120/31 days
- d) 3 days

Answer: C

A's one day work = $1/4$

B's one day work = $1/6$

C's one day work = $1/10$

(A + B + C)'s one day work = $1/4 + 1/6 + 1/10$

$$= (15 + 10 + 6)/60$$

$$= 31/60$$

They can finish 50% of the work = $31/60 \times 50\%$

$$= 31/60 \times 50/100$$

$$= 31/60 \times 1/2$$

$$= 31/120$$

(A + B + C) can complete the work in 120/31 days.

6. If $\sin A = 1/2$ and $A + B = 90^\circ$, Find $\cos B$.

a) $1/2$

b) $-1/2$

c) 3

d) 0

Answer: A

$$\sin A = 1/2$$

$$A = 30^\circ$$

$$A + B = 90^\circ$$

$$B = 60^\circ$$

$$\cos 60^\circ = 1/2$$

7. Length of the rectangle is 10% more than its breadth. If the area of the rectangle is 110 cm^2 , find the breadth of the rectangle.

- a) 10 cm
- b) 11 cm
- c) 9 cm
- d) 12 cm

Answer: A

Let the length of the rectangle be 'l',

The breadth of the rectangle be 'b'

According to the question,

$$l = 110\% \times b$$

$$l = 110/100 \times b$$

$$l = 11/10 \times b$$

$$\text{Area of the rectangle} = 110 \text{ cm}^2$$

$$l \times b = 110$$

$$11/10 \times b \times b = 110$$

$$b^2 = 100$$

$$b = 10 \text{ cm}$$

8. Solve: $1/(1 \times 2) + 1/(2 \times 3) + 1/(3 \times 4) + \dots + 1/(9 \times 10)$.

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- a) 2/5
- b) 3/5
- c) 46/55
- d) 9/10

Answer: D

$$\begin{aligned} & 1/(1 \times 2) + 1/(2 \times 3) + 1/(3 \times 4) + \dots + 1/(9 \times 10) \\ &= (1 - 1/2) + (1/2 - 1/3) + (1/3 - 1/4) + (1/4 - 1/5) + \\ & (1/5 - 1/6) + (1/6 - 1/7) + (1/7 - 1/8) + (1/8 - 1/9) + \\ & (1/9 - 1/10) \\ &= (1 - 1/10) \\ &= 9/10 \end{aligned}$$

9. Find the value of $(243)^2 / (27)^3 \times 16 \div 8$

- a) 54
- b) 9
- c) 6
- d) 8

Answer: C

$$\begin{aligned} & (243)^2 / (27)^3 \times 16 \div 8 \\ &= (27 \times 9)^2 / (27)^3 \times 16 / 8 \\ &= (9)^2 / (27) \times 2 \\ &= 81/27 \times 2 \\ &= 3 \times 2 \\ &= 6 \end{aligned}$$

10. When a number is divisible by 119, remainder is

19. What will be the remainder obtained by dividing the same number by 17?

- a) 1
- b) 2
- c) 3
- d) 4

Answer: B

$$19 \div 17 = 2$$

The remainder obtained by dividing is 2.

11. The investment of A : B is 1.5 lakhs and 1 lakhs. If profit made by them is Rs. 24000/- in one year, then find the profit of B.

- a) Rs. 1800/-
- b) Rs. 14000/-
- c) Rs. 9600/-
- d) Rs. 1200/-

Answer: C

$$\text{Profit of B} = 1/2.5 \times 24000 = \text{Rs. } 9600/-$$

12. For a certain distance, C takes 60 minutes. The ratio of the speed of A and B is 2 : 1 and the ratio of speed of B and C is 3 : 1, so how much time will B take to cover the same distance?

- a) 20 minutes
- b) 10 minutes
- c) 60 minutes
- d) 30 minutes

Answer: A

$$\text{Speed} = \text{Distance} / \text{time}$$

$$\text{Speed} \propto 1 / \text{Time}$$

$$A : B = 2 : 1$$

$$B : C = 3 : 1$$

$$\text{Ratio of speed of A : B : C} = 6 : 3 : 1$$

$$\text{Ratio of time of A : B : C} = 1/6 : 1/3 : 1$$

We can write it as,

$$A : B : C = 1 : 2 : 6$$

$$\text{Time taken by C} = 6 = 60 \text{ minutes}$$

$$\text{So, } 1 = 10 \text{ minutes}$$

$$\text{It means } B = 2 \times 10 = 20 \text{ minutes}$$

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13. There is a 10% reduction in the price of an item every year. After 2 years, the value of the item is Rs. 16200/-, and then finds the initial value.

- a) Rs. 2000
- b) Rs. 8000
- c) Rs. 10000
- d) Rs. 20000

Answer: D

Let the initial value be x,

According to the question,

$$x \times 90\% \times 90\% = 16200$$

$$x \times 90/100 \times 90/100 = 16200$$

$$x \times 81/100 = 16200$$

$$x = 1620000/81$$

$$x = 20000$$

14. If Rs. 36000 is divided into A, B and C in the ratio of 2 : 3 : 4, then find the share of B.

- a) Rs. 18000
- b) Rs. 12000
- c) Rs. 8000
- d) Rs. 16000

Answer: B

$$\text{Share of B} = 3/9 \times 36000$$

$$= 3 \times 4000$$

$$= \text{Rs. } 12000$$

15. What should be added to the number 5474 that the obtained sum is completely divided by 3, 4, 6 and 8?

- a) 20
- b) 24
- c) 6

d) 22

Answer: D

$$\text{LCM}(3, 4, 6, 8) = 24$$

When $5474 \div 24$ we get remainder as 6, so to make remainder as 0, we have to add 22 with 5474 it means $5474 + 22 = 5496$ which is completely divisible by 24.

16. Find the semi-diameter of the circle whose area is equal to the sum of the area of the three circles whose semi-diameter is 12 cm, 8 cm and 9 cm respectively.

- a) 29 cm
- b) 19 cm
- c) 17 cm
- d) 15 cm

Answer: C

$$\pi R^2 = \pi r_1^2 + \pi r_2^2 + \pi r_3^2$$

$$R^2 = r_1^2 + r_2^2 + r_3^2$$

$$R^2 = 12^2 + 8^2 + 9^2$$

$$R^2 = 144 + 64 + 81$$

$$R^2 = 289$$

$$R = \sqrt{289}$$

$$R = 17 \text{ cm}$$

17. If one side of a smaller square is $1/10$ m, then how many such small squares can fit in a square of 4 m side?

- a) 400
- b) 1600
- c) 160
- d) 40

Answer: B

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$$n = (4 \times 4) / (1/10 \times 1/10) = 16 \times 10 \times 10 = 1600$$

18. If $\sqrt{15} = 3.87$, then find the value of $\sqrt{3}/\sqrt{5}$.

- a) 0.774
- b) 3.87
- c) 2.54
- d) 1.26

Answer: A

$$\sqrt{3}/\sqrt{5} = \sqrt{3}/\sqrt{5} \times \sqrt{5}/\sqrt{5} = \sqrt{15}/\sqrt{5} \times \sqrt{5} = \sqrt{15}/5 = 3.87/5 = 0.774$$

19. A man cover half of distance with a speed of 10kmph and half of distance with a speed of 20 kmph, total time taken by him is 10 hour, then find the distance travelled by him.

- a) 100/3
- b) 400/3
- c) 200/3
- d) 250/3

Answer: B

$$\text{Distance} = 2 \times \{10 \times 20/30 \times 10\} = 400/3$$

20. If A can complete a work in 40 days, A and B can complete the work in 30 days, then find how many days taken by B to complete the work.

- a) 70 days
- b) 20 days
- c) 120 days
- d) 10 days

Answer: C

$$\text{A's one day work} = 1/40$$

$$(\text{A} + \text{B})\text{'s one day work} = 1/30$$

$$\text{B's one day work} = 1/30 - 1/40$$

$$= (4 - 3) / 120$$

$$= 1 / 120$$

No. of days B take to complete the work = 120 days.

21. Area of four walls is $60x + 180$ and length is $3x + 10$ and breadth is $2x + 5$, then find the value of Height.

- a) 6
- b) 2
- c) 3
- d) 5

Answer: A

$$\text{Area of four walls} = 60x + 180$$

$$2h \times (l + b) = 60x + 180$$

$$2h \times (3x + 10 + 2x + 5) = 60x + 180$$

$$2h \times (5x + 15) = 60x + 180$$

$$2h \times (5x + 15) = 60(x + 3)$$

$$h \times (5x + 15) = 30(x + 3)$$

$$h \times 5(x + 3) = 30(x + 3)$$

$$h = 30/5$$

$$h = 6$$

22. If LCM is equal to 20th multiple of 3 and HCF is 6, also first number is 30, then find the second number.

- a) 20
- b) 18
- c) 15
- d) 12

Answer: D

Let the second number be x

$$\text{LCM} \times \text{HCF} = \text{first number} \times x$$

$$60 \times 6 = 30 \times x$$

$$360 = 30 \times x$$

$$x = 12$$

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23. If ratio of A : B is 3 : 4 and B : C is 5 : 6, then find the ratio of A : C.

- a) 3 : 5
- b) 5 : 3
- c) 5 : 8
- d) 3 : 8

Answer: C

$$A : B = 3 : 4$$

$$B : C = 5 : 6$$

$$A : B : C = 15 : 20 : 24$$

$$\text{So, } A : C = 15 : 24$$

$$A : C = 5 : 8$$

24. The median of 1, 7, 12, $x + y$, $x - y$, 20, 29, 30 is 16, then find the value of x .

- a) 10
- b) 16
- c) 29
- d) 30

Answer: B

$$(x + y + x - y) / 2 = 16$$

$$2x / 2 = 16$$

$$x = 16$$

25. If $\tan \theta = x - 1/4x$, then find the value of $\tan \theta - \sec \theta$.

- a) $-1/2$
- b) $1/2$
- c) $-21/2$
- d) $21/2$

Answer: A

$$\tan \theta = x - 1/4x$$

if we put $x = 1$, we get

$$\tan \theta = 1 - 1/4 = 3/4$$

$$\tan \theta = 3/4$$

$$\tan \theta = 3/4 = \text{Perpendicular} / \text{Base}$$

By using Pythagoras theorem,

$$\text{Hypotenuse}^2 = \text{Perpendicular}^2 + \text{Base}^2$$

$$\text{Hypotenuse}^2 = 3^2 + 4^2$$

$$\text{Hypotenuse}^2 = 9 + 16$$

$$\text{Hypotenuse}^2 = 25$$

$$\text{Hypotenuse} = \sqrt{25}$$

$$\text{Hypotenuse} = 5$$

$$\text{So, } \sec \theta = \text{Hypotenuse} / \text{Base} = 5/4$$

$$\tan \theta - \sec \theta = 3/4 - 5/4$$

$$= -2/4$$

$$= -1/2$$

26. Solve: $9 \div 3 \times (-6 - 2 \times 2) - 4 + 5 \div 5 \times 10$

- a) 24
- b) -24
- c) $-10/3$
- d) 26

Answer: B

$$9 \div 3 \times (-6 - 2 \times 2) - 4 + 5 \div 5 \times 10$$

$$= 9/3 \times (-6 - 4) - 4 + 5/5 \times 10$$

$$= 9/3 \times -10 - 4 + 1 \times 10$$

$$= 3 \times -10 - 4 + 10$$

$$= -30 - 4 + 10$$

$$= -34 + 10$$

$$= -24$$

27. If area of path is 1386 cm^2 and width is 7 cm, then find the radius of inner circle.

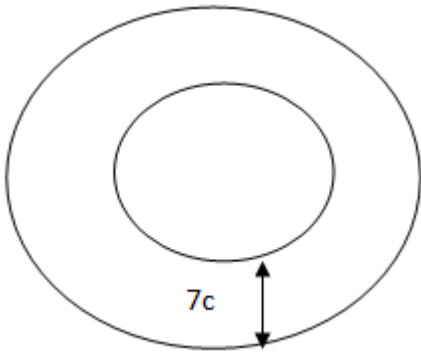
- a) 38 cm
- b) 28 cm

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c) 35 cm

d) 21 cm

Answer: B



$$1386 = \pi (R^2 - r^2)$$

$$1386 = \frac{22}{7} \times (R + r) \times (R - r)$$

$$1386 = \frac{22}{7} \times (R + r) \times 7$$

$$R + r = 63$$

Given: $R - r = 7$

Then $r = 28$ cm

28. In $\triangle ABC$, ratio of $\angle A : \angle B : \angle C = 2 : 3 : 5$, then find the angles.

a) $36^\circ, 54^\circ, 19^\circ$

b) $36^\circ, 54^\circ, 90^\circ$

c) $16^\circ, 54^\circ, 90^\circ$

d) $36^\circ, 14^\circ, 90^\circ$

Answer: B

$$\angle A : \angle B : \angle C = 2 : 3 : 5$$

$$10x = 180^\circ$$

$$x = 18^\circ$$

$$\text{so, } \angle A = 2 \times x = 2 \times 18^\circ = 36^\circ$$

$$\angle B = 3 \times x = 3 \times 18^\circ = 54^\circ$$

$$\angle C = 5 \times x = 5 \times 18^\circ = 90^\circ$$

29. If $6x^2 - 5x + 1 = 0$ and their zeroes are α, β , then find the value of $\alpha^2 + \beta^2$.

a) $17/36$

b) $13/36$

c) $15/36$

d) $14/36$

Answer: B

$$6x^2 - 5x + 1 = 0$$

$$6x^2 - 3x - 2x + 1 = 0$$

$$3x(2x - 1) - 1(2x - 1) = 0$$

$$(3x - 1)(2x - 1) = 0$$

$$x = 1/3, 1/2$$

$$\text{so, } \alpha = 1/3, \beta = 1/2$$

$$\alpha^2 + \beta^2$$

$$= (1/3)^2 + (1/2)^2$$

$$= 1/9 + 1/4$$

$$= 13/36$$

30. Find the median of 8, 6, 9, 12, 6, 8, 7, and 11.

a) 18

b) 12

c) 6

d) 9

Answer: D

$$\text{Median} = \frac{12 + 6}{2}$$

$$= 18/2$$

$$= 9$$

General Awareness

1) Who is the CEO of NITI AAYog?

a) Rajiv Kumar

b) Rao Inderjit Singh

c) Amitabh Kant

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d) Narendra Singh Tomar

Answer: c)

Mr. Amitabh Kant is presently CEO of National Institution for Transforming India (NITI).

2) Who coined the term Homo sapiens?

a) Oswald Avery

b) James Black

c) Elizabeth Blackwell

d) Carl Linnaeus

Answer: d)

The species binomial "Homo sapiens" was coined by Carl Linnaeus in his 18th-century work Systema Naturae.

3) Who is the Orange Cap holder in IPL 2020?

a) Pawan Negi

b) Adam Zampa

c) David Warner

d) Shahbaz Ahamad

Answer: c)

David Andrew Warner is an Australian international cricketer and a former captain of the Australian national team. He is the Orange Cap holder in IPL 2020.

4) Where is Taklamakan desert situated?

a) China

b) Nepal

c) India

d) Bhutan

Answer: a)

The Taklamakan Desert is a desert in Southwest Xinjiang in Northwest China. It is bounded by the Kunlun Mountains to the south, the Pamir Mountains and Tian Shan to the west and north and the Gobi Desert to the east.

5) Ram Prasad Bismil was hanged because of Kakori conspiracy in which year?

a) 1921

b) 1923

c) 1925

d) 1931

Answer: c)

Ram Prasad Bismil, Ashfaqulla Khan and Roshan Singh were hanged to death for their involvement in Kakori conspiracy (1925).

6) What is the scientific name of Wheat?

a) Triticum

b) Hordeum vulgare

c) Avena sativa

d) Zea mays

Answer: a)

Wheat is a grass widely cultivated for its seed, a cereal grain which is a worldwide staple food. The many species of wheat together make up the genus Triticum.

7) Who won the Nobel peace prize in 2007?

a) Intergovernmental Panel on Climate Change

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- b) Al Gore
- c) Muhammad Yunus
- d) Both a and b

Answer: d)

Intergovernmental Panel on Climate Change (IPCC) and Albert Arnold (Al) Gore Jr. won the Nobel peace prize in 2007 "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.

8) Who is the President of Sri Lanka?

- a) Gotabaya Rajapaksa
- b) Maithripala Sirisena
- c) Mahinda Rajapaksa
- d) Chandrika Bandaranaike Kumaratunga

Answer: a)

Gotabaya Rajapaksa is a Sri Lankan politician and former military officer currently serving as the 8th President of Sri Lanka since 2019.

9) Who is the governor of RBI?

- a) Michael Patra
- b) Viral Acharya
- c) Shaktikanta Das
- d) Urjit Patel

Answer: c)

Shaktikanta Das, former Secretary, in Ministry of Finance, Government of India assumed charge as

the 25th Governor of the Reserve Bank of India effective December 12, 2018.

10) Which gulf joins the Pacific and Atlantic ocean?

- a) Gulf of Oman
- b) Gulf of Aqaba
- c) Gulf of Kachchh
- d) Panama canal

Answer: d)

The Panama Canal is an artificial waterway in Panama that connects the Atlantic Ocean with the Pacific Ocean. The canal cuts across the Isthmus of Panama and is a conduit for maritime trade.

11) Who was the first chairman of the constituent assembly?

- a) Sachchidananda Sinha
- b) BN Rau
- c) Rajendra Prasad
- d) Harendra Coomar Mookerjee

Answer: a)

Dr Sachchidananda Sinha was the first temporary chairman of the Constituent Assembly. Later, Dr Rajendra Prasad was elected as the President and its Vice President was Harendra Coomar Mookerjee.

12) In 1921, Albert Einstein got a noble prize in which field?

- a) Economics
- b) Medical Science
- c) Physics

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d) Chemistry

Answer: c)

The Nobel Prize in Physics 1921 was awarded to Albert Einstein "for his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect."

13) Consider the following statements regarding Pradhan Mantri Ujjawala Yojana-

1) This Scheme aims to provide free LPG connections to Women from BPL Households by providing financial support.

2) This measure will empower women and protect their health.

Which of the above statements are correct?

- a) Only 1
- b) Only 2
- c) Both 1 and 2
- d) Neither 1 nor 2

Answer: c)

Pradhan Mantri Ujjwala Yojana (PMUY) was launched by Prime Minister of India Narendra Modi on 1 May 2016 to distribute 50 million LPG connections to women of BPL families. Providing LPG connections to BPL households will ensure universal coverage of cooking gas in the country. This measure will empower women and protect their health.

14) Who is the inventor of C language?

- a) Dennis M. Ritchie

b) Herman Hollerith

c) John Mauchley

d) J.Presper Eckert

Answer: a)

C, computer programming language was developed in the early 1970s by American computer scientist Dennis M. Ritchie at Bell Laboratories.

15) After independence who was the speaker of constitutional assembly?

- a) Ganesh Vasudev Mavalankar
- b) Moturi Satyanarayana
- c) B Pattabhi Sitaramayya
- d) K M Munshi

Answer: a)

Ganesh Vasudev Mavalankar was an independence activist, the President of the Central Legislative Assembly, then Speaker of the Constituent Assembly of India, and later the first Speaker of the Lok Sabha, the lower house of the Parliament of India.

16) Fundamental duties are added through which constitutional amendment?

- a) 15th amendment
- b) 24th amendment
- c) 42nd amendment
- d) 56th amendment

Answer: c)

The Fundamental Duties of citizens were added to the Constitution by the 42nd Amendment in 1976,

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upon the recommendations of the Swaran Singh Committee that was constituted by the Government.

17) Who invented the computer?

- a) Scott Aaronson
- b) Rediet Abebe
- c) Hal Abelson
- d) Charles Babbage

Answer: d)

English mathematician and inventor Charles Babbage is credited with having conceived the first automatic digital computer.

18) Which of the following was published by Gandhiji during his stay in South Africa?

- a) Nav Jivan
- b) Indian opinion
- c) Young India
- d) India Gazzete

Answer: b)

The Indian Opinion was a newspaper established by Indian leader Mohandas Gandhi. The publication was an important tool for the political movement led by Gandhi and the Indian National Congress to fight racial discrimination and win civil rights for the Indian immigrant community in South Africa.

19) Who Designed Gateway of India?

- a) George Wittet
- b) Dankmar Adler
- c) Frank Shaver Allen

d) Henry Austin

Answer: a)

Gateway of India was built as a triumphal arch to commemorate the visit of King George V and Queen Mary to Mumbai (then, Bombay). It was built at Apollo Bunder, a popular meeting place. It was designed by the British architect, George Wittet.

20) Who among the following was the first women President of the Indian National Congress?

- a) Indira Gandhi
- b) Annie Besant
- c) Aruna Asaf ali
- d) Sucheta Kriplani

Answer: b)

Annie Besant was the first woman President of Indian National Congress. She presided over the 1917 Calcutta session of the Indian National Congress.

21) Who is the author of 'India Divided'?

- a) Sardar Vallabhbhai Patel
- b) B.R Ambedkar
- c) BN Rau
- d) Rajendra Prasad

Answer: d)

India Divided is a nonfiction book published in 1947, just one year before India was in fact divided into the separate countries of India and Pakistan. The author of India Divided was Rajendra Prasad.

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22) The International Rice Research Institute is in_____.

- a) United States
- b) United Kingdom
- c) Singapore
- d) Philippines

Answer: d)

The International Rice Research Institute is an international agricultural research and training organization with its headquarters in Los Banos, Laguna in the Philippines, and offices in seventeen countries.

23) Which is the world's largest island?

- a) Borneo
- b) Greenland
- c) Bali
- d) Sumatra

Answer: b)

Greenland is the world's largest island, located between the Arctic and Atlantic oceans, east of the Canadian Arctic Archipelago. It is an autonomous territory within the Kingdom of Denmark.

24) Asia's biggest spice market is located in_____.

- a) Kolkata
- b) New-Delhi
- c) Bangkok
- d) Singapore

Answer: b)

Delhi's Khari Baoli is Asia's largest spice market. It came into being during the 17th century, dating back to the Mughal era.

25) Who built the famous Gol Gumbaz at Bijapur?

- a) Mohammed Adil Shah
- b) Qutub-ud-Din Aibak
- c) Babur
- d) Humayun

Answer: a)

Gol Gumbaz was built by Mohammed Adil Shah, Sultan of Bijapur and the seventh ruler of the Adil Shahi dynasty. It was built in the year 1656.

26) Who was the first to recognize the full circulation of the blood in the human body?

- a) William Harvey
- b) Antony van Leeuwenhoek
- c) Casimir Funk
- d) Eugen Stainak

Answer: a)

William Harvey was an English physician who was the first to recognize the full circulation of the blood in the human body.

27) Which state has highest wheat production in India?

- a) Rajasthan
- b) Gujarat
- c) West-Bengal
- d) Uttar Pradesh

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Answer: d)

The largest wheat producing state in our country is Uttar Pradesh. Uttar Pradesh stands fourth as per area and first population-wise. Uttar Pradesh contributes to its economy in agriculture mainly by producing wheat and sugar cane.

28) Which movement was started by Gandhiji after returning from South-africa?

- a) Champaran Satyagraha
- b) Dandi March
- c) Civil-Disobedience Movement
- d) Quit India Movement

Answer: a)

The Champaran Satyagraha of 1917 was the first Satyagraha movement inspired by Gandhiji and a major revolt in the Indian Independence Movement through which he entered into the Indian Politics.

29) Which law validates the statement that 'All the planets move around the sun in an elliptical orbit, with the sun being at rest at one focus of the orbit'?

- a) Newton's Law of Gravitation
- b) Law of Conservation of Linear Momentum
- c) Kepler's First Law of Planetary motion
- d) Newton's first law of motion

Answer: c)

Three laws devised by Johannes Kepler to define the mechanics of planetary motion. The first law states that planets move in an elliptical orbit, with the Sun being one focus of the ellipse. This law identifies that

the distance between the Sun and Earth is constantly changing as the Earth goes around its orbit.

30) Sariska wildlife sanctuary is located in which state?

- a) Uttarakhand
- b) Odisha
- c) Rajasthan
- d) Tamil Nadu

Answer: c)

Sariska National Park is a national park and wildlife preserve in eastern Rajasthan state, northwestern India. It was established in 1955 in Sariska Forest as a wildlife sanctuary and was declared a national park in 1979.

31) Who is the first women to climb Mount Everest?

- a) Bachendri Pal
- b) Arunima Sinha
- c) Premlata Agarwal
- d) Poorna Malavath

Answer: a)

Bachendri Pal is an Indian mountaineer, who in 1984 became the first Indian woman to reach the summit of Mount Everest.

32) The Hindu Widows Remarriage Act, was enacted in which year?

- a) 1856
- b) 1858
- c) 1855

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d) 1851

Answer: a)

The Hindu Widows' Remarriage Act, 1856, enacted on 26 July 1856, legalised the remarriage of Hindu widows in all jurisdictions of India under East India Company rule. It was drafted by Lord Dalhousie and passed by Lord Canning before the Indian Rebellion of 1857.

33) Lucknow Pact was signed in which year?

a) 1916

b) 1918

c) 1921

d) 1911

Answer: a)

The Lucknow Pact was an agreement reached between the Indian National Congress and the Muslim League at a joint session of both the parties held in Lucknow in December 1916.

34) Which country has no volcanic eruption?

a) Indonesia

b) Japan

c) Australia

d) Chile

Answer: c)

Every continent on Earth has volcanoes, but Australia does not have any active volcanoes.

35) Where is the headquarters of UNEP?

a) Washington DC, USA

b) Brussels, Belgium

c) Moscow, Russia

d) Nairobi, Kenya

Answer: d)

The United Nations Environment Programme (UNEP) is responsible for coordinating responses to environmental issues within the United Nations system. Its headquarters are in Nairobi, Kenya.

36) Which is the most spoken language of Lakshadweep?

a) Bengali

b) Kannada,

c) Konkani

d) Malayalam

Answer: d)

Most of the Lakshadweep islanders speak Malayalam. Mahi which is akin to old Sinhalese, is spoken on Minicoy. However, some people also speak Hindi.

37) What is the other name of CaO?

a) Plaster of Paris

b) Blue vitriol

c) acetic acid

d) Quicklime

Answer: d)

Calcium oxide (CaO), commonly known as quicklime or burnt lime, is a widely used chemical compound. It is a white, caustic, alkaline, crystalline solid at room temperature.

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38) Who gave Raja Ram Mohan roy the title of 'Raja'?

- a) Akbar II
- b) Shah Jahan
- c) Babur
- d) Aurangzeb

Answer: a)

Raja Ram Mohan Roy was one of the founders of the Brahma Sabha, the precursor of the Brahma Samaj, a social-religious reform movement in the Indian subcontinent. He was given the title of Raja by Akbar II, the Mughal emperor.

39) The Natal Indian Congress (NIC) was founded in which year?

- a) 1899
- b) 1894
- c) 1888
- d) 1895

Answer: b)

The Natal Indian Congress (NIC) was an organisation that aimed to fight discrimination against Indians in South Africa. It was founded by Mahatma Gandhi in 1894.

40) The Directive Principles of State Policy are contained in which part of the Indian constitution?


- a) Part III
- b) Part V
- c) Part IV
- d) Part VII

Answer: c)


The Directive Principles of State Policy contained in Part IV, Articles 36-51 of the Indian constitution constitute the most interesting and enchanting part of the constitution.



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