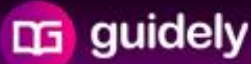


**RRB NTPC Memory Based Model Paper Based on Dec 31 Exam**



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**Mathematics**

1. Find the value of  $\cos 20^\circ \cos 40^\circ \cos 80^\circ$ .

- a) 1/2
- b) 1/6
- c) 1/16
- d) 1/8

Answer: D

$$\cos 20^\circ \cos 40^\circ \cos 80^\circ$$

Multiply and divide by 2

$$= \frac{1}{2} (2 \cos 20^\circ \cos 40^\circ \cos 80^\circ)$$

$$= \frac{1}{2} (\cos(20^\circ + 80^\circ) + \cos(20^\circ - 80^\circ)) \cos 40^\circ \quad (2 \cos a \cos b = \cos(a+b) + \cos(a-b))$$

$$= \frac{1}{2} (\cos(-60^\circ) + \cos(100^\circ)) \cos 40^\circ$$

$$= \frac{1}{2} (\frac{1}{2} + \cos 100^\circ) \cos 40^\circ$$

$$= \frac{1}{4} \cos 40^\circ + \frac{1}{2} (\cos 40^\circ \cos 100^\circ)$$

$$= \frac{1}{4} \cos 40^\circ + \frac{1}{2} (\cos 40^\circ \cos 100^\circ)$$

Multiply and divide by 2

$$= \frac{2}{2} (\frac{1}{4} \cos 40^\circ) + \frac{1}{4} (2 \cos 40^\circ \cos 100^\circ)$$

$$= \frac{1}{4} \cos 40^\circ + \frac{1}{4} (\cos 140^\circ + \cos(-60^\circ)) \quad (2 \cos a \cos b = \cos(a+b) + \cos(a-b))$$

$$= \frac{1}{4} \cos 40^\circ + \frac{1}{4} \cos 140^\circ + \frac{1}{8} (\cos 60^\circ = \frac{1}{2})$$

$$= \frac{1}{4} (\cos 40^\circ + \cos 140^\circ) + \frac{1}{8}$$

$$= \frac{1}{4} (2 \cos 90^\circ \cos(-50^\circ)) + \frac{1}{8} \quad (\text{as above identity})$$

$$= 0 + \frac{1}{8}$$

$$= \frac{1}{8}$$

$$= \frac{1}{8}$$

2. After two successive discounts of 10% and 12%, an article is sold for Rs. 6732. What is the marked price of the article?

- a) Rs. 8500
- b) Rs. 8600
- c) Rs. 8400
- d) Rs. 8250

Answer: A

The effective discount on giving successive discounts of 10% and 12% can be calculated as-  
 $10 + 12 - (10 \times 12)/100 = 20.80\%$

Let the marked price of the article be Rs. 'x'.

$$0.792x = 6732$$

$$x = \text{Rs. } 8500$$

So, the marked price of the article is Rs. 8500.

3. What is the unit digit of  $(3^{65} \times 6^{59} \times 7^{71})$ ?:

- a) 2
- b) 4
- c) 6
- d) 8

Answer: B

$$\text{Unit digit in } 3^4 = 1 \Rightarrow \text{Unit digit in } (3^4)^{16} = 1$$

$$\text{Therefore, Unit digit in } 3^{65} = \text{Unit digit in } [(3^4)^{16} \times 3] = (1 \times 3) = 3$$

$$\text{Unit digit in } 6^{59} = 6$$

$$\text{Unit digit in } 7^4 \Rightarrow \text{Unit digit in } (7^4)^{17} \text{ is } 1.$$

$$\text{Unit digit in } 7^{71} = \text{Unit digit in } [(7^4)^{17} \times 7^3] = (1 \times 3) = 3$$

$$\text{Therefore Required digit} = \text{Unit digit in } (3 \times 6 \times 3) = 4.$$

We are given

$$432^{412} \times 499^{431}$$

$$2^4 \times 9 = 6 \times 4 = 24$$

$$\text{Unit digit} = 4$$

4. If

$$\sqrt{4248} = 68, \text{ then find out value of } \sqrt{42.48} + \sqrt{0.4248} + \sqrt{0.004248}$$

- a) 7.468
- b) 7.448

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c) 7.548

d) 7.450

Answer: C

$$\begin{aligned} &\sqrt{42.48} + \sqrt{.4248} + \sqrt{.004248} \\ &= 6.8 + .68 + .068 \\ &= 7.548 \end{aligned}$$

5. If

$$x^3 + y^3 = 35 \text{ and } x + y = 5 \text{ then find the value of } x^4 + y^4.$$

a) 97

b) 93

c) 91

d) 92

Answer: A

$$(x + y)^3 = x^3 + y^3 + 3xy(x + y)$$

$$\text{or, } 5^3 = 35 + 3xy(5)$$

$$\text{or, } 125 - 35 = 15xy$$

$$\text{or, } xy = \frac{90}{15} = 6$$

$$\text{Now, } (x - y)^2 = (x + y)^2 - 4xy$$

$$= 5^2 - 4 \times 6$$

$$= 25 - 24 = 1$$

$$\therefore x - y = \sqrt{1} = 1$$

$$\text{Now, } x + y = 5 \text{ and } x - y = 1$$

Solving this,

$$x = 3 \text{ and } y = 2$$

$$\text{Now, } x^4 + y^4 = 3^4 + 2^4 = 97$$

6. The sum of two numbers is 60 and their HCF and LCM are 12 and 72 respectively. Find the sum of their reciprocals.

a) 2

b) 2/5

c) 6/5

d) 5/6

Answer: D

Let the number are x, y

HCF = 12, LCM = 72, and

$$12x + 12y = 60$$

$$\Rightarrow x + y = 5 \dots\dots\dots (i)$$

$$\text{and } 12xy = 72 \Rightarrow xy = 6 \dots\dots\dots (ii)$$

Solving equation (i) and (ii)

$$x = 3, y = 2$$

$$\text{Now } \frac{1}{x} + \frac{1}{y} = \frac{1}{3} + \frac{1}{2} = \frac{5}{6}$$

7. The cost price of 8 articles is same as the selling price of 5 articles. Find the profit percentage.

a) 55%

b) 44%

c) 60%

d) 48%

Answer: C

$$8CP = 5SP$$

$$\Rightarrow \frac{CP}{SP} = \frac{5}{8} \Rightarrow$$

$$\text{Cost price} = 5, \text{ Selling price} = 8$$

$$\text{Then profit \%} = \frac{\text{profit}}{CP} \times 100 = \frac{3}{5} \times 100 = 60\%$$

8. In an examination 55% of the candidates passed in English, 35% candidates passed in Maths, and 20% candidates passed in both of these subjects. If 1200 candidates failed in both the subjects then the number of candidates who appeared at the examination was.

a) 4000

b) 4500

c) 6000

d) 5500

Answer: A

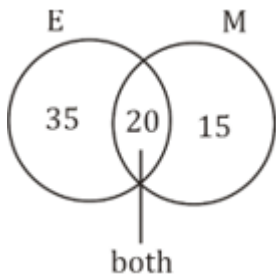
$$\text{Passed in English} = 55\%$$

$$\text{Passed in Math} = 35\%$$

$$\text{Passed in both subject} = 20\%$$

$$\text{Failed} = 1200$$

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Total passed students = 35 + 20 + 15 = 70%

Failed = 30%

But, failed = 1200

Now 30% = 1200

Then 100% =  $(1200/30) \times 100 = 4000$

9. Train A of length 250 m crosses a pole in 25 seconds. Train B travelling at the same speed crosses a 400 m long platform in 1 minute. Find the time taken by train B to cross train A, if the train A is stationary.

- a) 45 seconds
- b) 42 seconds
- c) 40 seconds
- d) 48 seconds

Answer: A

Speed of train A =  $250/25 = 10$  m/sec

So, speed of train B = 10 m/sec

Let the length of train B be 'x' m.

Then,  $(x + 400)/10 = 60$

$x = 200$  m

Total length of both trains =  $(250 + 200) = 450$  m

So, time taken by train B to cross train A =  $450/10 = 45$  seconds

10. If A : B = 15 : 16, B : C = 8 : 25, and C : D = 50 : 9 then find the value of A : D.

- a) 15 : 13
- b) 15 : 9
- c) 40 : 9
- d) 35 : 9

Answer: B

Given A : B = 15 : 16, B : C = 8 : 25 and C : D = 50 : 9

$$\frac{A}{D} = \frac{A}{B} \times \frac{B}{C} \times \frac{C}{D}$$

$$\frac{A}{D} = \frac{15}{16} \times \frac{8}{25} \times \frac{50}{9}$$

$$\frac{A}{D} = \frac{15}{9}$$

11. 12% of 1200 + ? = 18% of 5400

- a) 834
- b) 828
- c) 1076
- d) 848

Answer: B

12% of 1200 + ? = 18% of 5400

$$\frac{12}{100} \times 1200 + x = \frac{18}{100} \times 5400$$

$$144 + x = 18 \times 54$$

$$\Rightarrow x = 972 - 144 = 828$$

$$x = 828$$

12.  $\frac{\sqrt{54} \times \sqrt{125}}{\sqrt{96} \times \sqrt{45}} = ?$

- a) 15/14
- b) 2/5
- c)  $\frac{5\sqrt{6}}{4\sqrt{5}}$
- d) 5/4

Answer: D

$$\frac{\sqrt{54} \times \sqrt{125}}{\sqrt{96} \times \sqrt{45}}$$

$$= \frac{3\sqrt{6} \times 5\sqrt{5}}{4\sqrt{6} \times 3\sqrt{5}} = \frac{15}{12} = \frac{5}{4}$$

13. The ratio of number of female to male at a party was 3 : 2. When 20 more male joined the party the ratio was reversed. Find number of female present at the party.

- a) 24
- b) 22
- c) 34
- d) 26

Answer: A

Let number of female and male be 3x and 2x respectively.

According to question,

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$$\Rightarrow \frac{3x}{2x+20} = \frac{2}{3}$$

$$\Rightarrow 9x = 4x + 40$$

$$x = 8$$

Initially female =  $3 \times 8 = 24$

14. If a sum of Rs.2400 gives a simple interest of Rs.640 in 4 years then find the rate of interest.

a)  $\frac{20}{3}\%$

b) 15%

c) 18%

d)  $\frac{15}{3}\%$

Answer: A

Time = 4 years

We know that,  $SI = \frac{p \times R \times 1}{100}$

$$\Rightarrow 640 = \frac{2400 \times 4 \times R}{100}$$

$$R = \frac{20}{3}\%$$

15. In  $\triangle ABC$ , if  $AB = 16$  cm,  $BC = x$  cm and in  $\triangle PQR$ ,  $PQ = 4$  cm,  $QR = 1.25$  cm. If  $\triangle ABC \sim \triangle PQR$  then find out value of  $x$ .

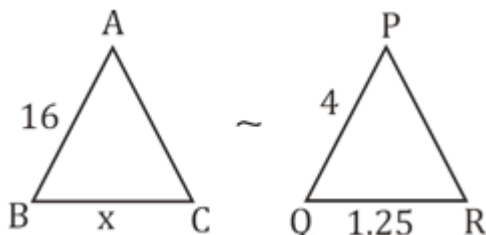
a) 3

b) 4

c) 5

d) 8

Answer: C



given  $\triangle ABC \sim \triangle PQR = \frac{AB}{BC} = \frac{PQ}{QR}$

$$\Rightarrow \frac{16}{x} = \frac{4}{1.25} \Rightarrow x = 5$$

16. The height of a cylinder is 14 cm and curved surface area is  $528 \text{ cm}^2$  then find the volume of cylinder.

a)  $1654 \text{ cm}^3$

b)  $1570 \text{ cm}^3$

c)  $1584 \text{ cm}^3$

d)  $1500 \text{ cm}^3$

Answer: C

given  $CSA = 528 \text{ cm}^2$  and  $h = 14 \text{ cm}$

We know that  $C.S.A = 2\pi rh = 528$

$$\text{or, } 2 \times \frac{22}{7} \times r \times 14 = 528$$

$$r = 6 \text{ cm}$$

Volume of cylinder =  $\pi r^2 h$

$$= \frac{22}{7} \times 6 \times 6 \times 14$$

$$= 1584 \text{ cm}^3$$

17. Ram, while working alone, can complete a work in 5 days less than the number of days taken by Raju. If while working together, they can complete the whole work in 6 days, then in how many days would Ram be able to complete the work alone?

a) 7 days

b) 11 days

c) 10 days

d) None of these

Answer: C

Let the number of days taken by Ram to complete the work alone be 'x' days.

Then, Raju will take 'x + 5' days to complete the work alone.

According to question,

$$\frac{1}{x} + \frac{1}{x+5} = \frac{1}{6}$$

$$6(2x+5) = x^2 + 5x$$

$$12x + 30 = x^2 + 5x$$

$$x^2 - 7x - 30 = 0$$

$$x^2 - 10x + 3x - 30 = 0$$

$$x(x-10) + 3(x-10) = 0$$

$$(x-10)(x+3) = 0$$

$$x = 10, -3$$

Since, x cannot be negative.

So,  $x = 10$

Time taken by Ram alone to do the work = 10 days.

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18. Ratio of length and breadth of a rectangle is 2 : 1 and its perimeter is 48 cm the find out area of the rectangle.

- a) 122 cm<sup>2</sup>
- b) 112 cm<sup>2</sup>
- c) 128 cm<sup>2</sup>
- d) 134 cm<sup>2</sup>

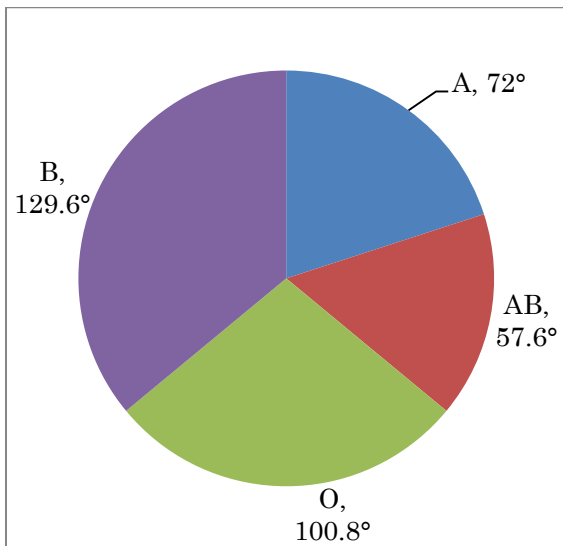
Answer: C

Let length and breadth of rectangle be 2x and x respectively.

$$\begin{aligned} \text{Perimeter} &= 2(l + b) = 2(2x + x) \\ &= 6x = 48 \\ x &= 8\text{cm} \end{aligned}$$

$$\begin{aligned} \text{Area of Rectangle} &= l \times b = 2x \times x \\ &= 16 \times 8 \\ &= 128\text{cm}^2 \end{aligned}$$

Direction (19-20): The given pie chart shows donor of blood group A, B, O and AB of 150 donors (values in degree). Observe the pie chart and answer the questions.



19. Find out number of donors having blood group O.

- a) 50
- b) 42
- c) 30
- d) 34

Answer: B

$$\begin{aligned} \text{Number of donor having blood group 'O'} &= \frac{100.8^\circ}{360} \times 150 = 42 \end{aligned}$$

20. What is the percentage of donor having blood group AB?

- a) 46%
- b) 26%
- c) 16%
- d) 36%

Answer: C

$$\% \text{ of donor having blood group AB} = \frac{57.6^\circ}{360^\circ} \times 100 = 16\%$$

21. If  $5\sin 75^\circ \sec 15^\circ + 3\cot 15^\circ \cot 75^\circ + 2\tan 45^\circ = ?$

- a) 16
- b) 12
- c) 15
- d) 10

Answer: D

$$\begin{aligned} \text{Given } &5\sin 75^\circ \sec 15^\circ + 3\cot 15^\circ \cot 75^\circ + 2\tan 45^\circ \\ &= 5 \cos 15^\circ \sec 15^\circ + 3\tan 75^\circ \cot 75^\circ + 2\tan 45^\circ \\ &= 5 + 3 + 2 \\ &= 10 \end{aligned}$$

22. Find the smallest number which when divided by 15, 28, 25, leaves remainder 8 in each case.

- a) 2208
- b) 2000
- c) 2082
- d) 2108

Answer: D

$$\text{LCM of } (15, 25, 28) = 2100$$

The smallest number which when divided by 15, 28, 25 leaves Remainder 8 is

$$\begin{aligned} &= 2100 + 8 \\ &= 2108 \end{aligned}$$

23. If  $2a + 5b = 12$ ,  $ab = 2$  and then  $8a^3 + 125b^3 = ?$

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- a) 1002
- b) 998
- c) 1006
- d) 1008

Answer: D

let  $a = 1, b = 2$

$2a + 5b = 12 \Rightarrow 2 \times 1 + 5 \times 2 = 12$  (Satisfied)

then  $8a^3 + 125b^3 = 8 \times 1^3 + 125 \times 8 = 8 + 1000 = 1008$

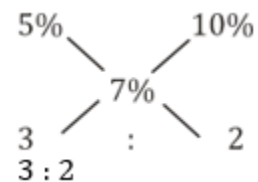
24. Rajesh lent some part of Rs.5000 at 5% and remaining at 10% per annum. If his yearly income is Rs.350 then find out the two parts from the following options.

- a) 4000 : 1000
- b) 2500 : 2500
- c) 3000 : 2000
- d) 2300 : 2700

Answer: C

total interest =  $\frac{350}{5000} \times 100 = 7\%$

"By using mixture and allegation method "



Actual parts will be 3000 and 2000

25. A can complete a work in 20 days and B in 40 days, If they work together for 5 days, then find out the remaining work.

- a) 5/8
- b) 17/35
- c) 2/15
- d) 3/17

Answer: A

Let total work = 40 unit (LCM of 20 and 40)

A's one day work = 2 unit

B's one day work = 1 unit

(A + B)'s one day work = 3unit

(A + B)'s 5 days work =  $3 \times 5 = 15$

Work left =  $40 - 15 = 25$

Fraction of work left =  $\frac{25}{40} = \frac{5}{8}$

26. How many natural numbers between 3 and 200 are divisible by 7?

- a) 37
- b) 25
- c) 28
- d) 26

Answer: C

7,14 .....196

First                      last

Number of terms =  $\frac{\text{Last term} - \text{First term}}{\text{difference}} + 1$   
 $= \frac{196-7}{7} + 1 = \frac{189}{7} + 1$   
 $= 27 + 1 = 28$

27.  $\sqrt{8 - 2\sqrt{15}}$  is equal to:

- a)  $5-\sqrt{3}$
- b)  $\sqrt{5}+\sqrt{3}$
- c)  $3-\sqrt{5}$
- d)  $\sqrt{5}-\sqrt{3}$

Answer: D

$\sqrt{8 - 2\sqrt{15}}$   
 $= \sqrt{(\sqrt{5})^2 + (\sqrt{3})^2 - 2\sqrt{5}\sqrt{3}}$   
 $= \sqrt{(\sqrt{5} - \sqrt{3})^2}$   
 $= \sqrt{5} - \sqrt{3}$

28. Number of passengers of bus, Train and car is in ratio 5 : 8 : 12, while the ratio of their fair per person is 3 : 4 : 5. Total fair of all passengers is Rs.107000 then find out total fair of passengers travelled in car?

- a) 40000
- b) 55000
- c) 45000
- d) 60000

Answer: D

## RRB NTPC Memory Based Model Paper Based on Dec 31 Exam

Let number of passengers of bus, Train and car is  $5x$ ,  $8x$  and  $12x$  respectively and their fair is  $3y$ ,  $4y$  and  $5y$  respectively.

$$\text{Total fair by bus} = 5x \times 3y = 15xy$$

$$\text{Total fair by train} = 8x \times 4y = 32xy$$

$$\text{Total fair by car} = 12x \times 5y = 60xy$$

$$\text{Total fair of all passengers} = 15xy + 32xy + 60xy =$$

Rs.107000

$$107xy = \text{Rs.}107000$$

$$xy = 1000$$

$$\text{Total fair by car} = 60xy = 60 \times 1000 = 60000$$

29. Simplify:  $3\frac{1}{5} \div 4\frac{1}{2}$  of  $5\frac{1}{3}$

a)  $2/30$

b)  $2/15$

c)  $1/10$

d)  $4/33$

Answer: B

$$3\frac{1}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3}$$

$$\Rightarrow \frac{16}{5} \div \frac{9}{2} \times \frac{16}{3}$$

$$\Rightarrow \frac{16}{5} \div 24$$

$$\Rightarrow \frac{16}{5} \times \frac{1}{24}$$

$$= \frac{2}{15}$$

30. The speed of a bus is 72 km/hr. Find out distance covered by the bus in 5 seconds.

a) 90m

b) 100 m

c) 50 m

d) 75m

Answer: B

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$= 72 \times \frac{5}{18} \times 5 = 100 \text{ m}$$

### Logical reasoning

1. Choose the odd one out.

a) Broad : Spreaded

b) Light : Heavy

c) Tiny : Small

d) Big : Large

Answer: B)

All options except 'Light : Heavy' are synonyms.

2. In a code language, TECHNOLOGY is written as 43@#&6+!= and BLISS is written as %+)\*\*\* then BIOLOGY will be coded as.

a) %)6=6!=

b) %)6+6!=

c) %)6+6!=

d) %+6)6!=

Answer: C)

T	E	C	H	N	O	L	O	G	Y
4	3	@	#	&	6	+	6	!	=

B	L	I	S	S
%	+	)	*	*

B	I	O	L	O	G	Y
%	)	6	+	6	!	=

3. A is father of B. O is mother of P. P is the mother of B. How is P related to A?

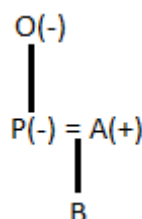
a) Wife

b) Husband

c) Mother

d) Father

Answer: A)



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P is wife of A.

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

Pressure : Pascal :: Temperature : ?

- a) Celcius
- b) Kelvin
- c) Fahrenheit
- d) Degree

Answer: B)

The S.I. unit of Pressure is Pascal.

Similarly,

The S.I. unit of Temperature is Kelvin.

5. 'MAN' is related to 'HOMO SAPIENS' in the same way as 'MANGO' is related to '\_\_\_\_\_'.  
\_\_\_\_\_

- a) MANGIFERA INDICA
- b) NELUMBO LUCIFERA
- c) MUSA
- d) FICUS BENGHALENSIS

Answer: A)

The scientific name of 'MAN' is 'HOMO SAPIENS'

Similarly,

The scientific name of 'MANGO' is 'MANGIFERA INDICA'.

6. Three of the following four letter-clusters are alike in a certain way and one is different. Pick the odd one out.

- a) CXEV
- b) BYDW
- c) LONM
- d) GTHS

Answer: D)

- a) CXEV → C ↔ X, C + 2 = E and E ↔ V

b) BYDW → B ↔ Y, B + 2 = D and D ↔ W

c) LONM → L ↔ O, L + 2 = N and N ↔ M

d) GTHS → G ↔ T, G + 1 = H and H ↔ S

7. Three statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

**Statements:**

All F are T

All T are R

Some T are not D

**Conclusions:**

I. Some D are not T

II. All D is F

III. No F is D

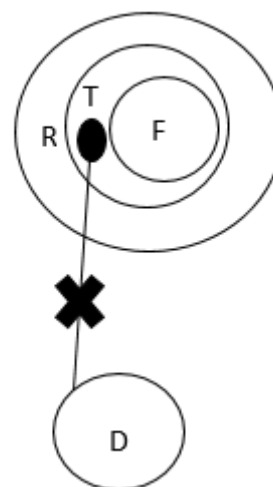
a) None follows

b) Only I follows

c) Both II and III follows

d) Either II or III follows

Answer: D)



I. Some D are not T → False

II. All D is F → False

III. No F is D → False



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But II and III forms a complementary pair.

Hence, either II or III follows.

8. Which two signs need to be interchanged to make the given equation correct?

$$5 \times 15 \div 7 - 20 + 4 = 77$$

- a)  $\div$  and  $\times$
- b)  $+$  and  $-$
- c)  $-$  and  $\times$
- d)  $+$  and  $\div$

Answer: D)

After interchanging  $+$  and  $\div$ , we get:

$$\text{L.H.S} = 5 \times 15 + 7 - 20 \div 4$$

$$= 75 + 7 - 5$$

$$= 75 + 2$$

$$= 77 = \text{R.H.S}$$

9. Arrange the following words as they would appear in English dictionary.

- 1. Irreversible
- 2. Irregular
- 3. Irresponsible
- 4. Itinerary
- 5. Illusion

a) 5, 2, 3, 1, 4

b) 5, 2, 1, 3, 4

c) 5, 3, 2, 1, 4

d) 5, 1, 3, 2, 4

Answer: A)

- 5. Illusion
- 2. Irregular
- 3. Irresponsible
- 1. Irreversible
- 4. Itinerary

10. Select the option that is related to the third number in the same way as the second number is related to the first number.

$$67 : 42 :: 78 : ?$$

- a) 67
- b) 56
- c) 89
- d) 54

Answer: B)

$$67 : 42 \rightarrow 6 \times 7 = 42$$



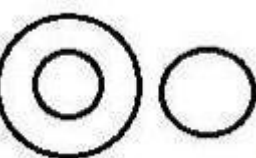
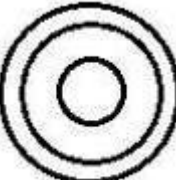
Similarly,

$$78 : ? \rightarrow 7 \times 8 = 56$$

So,  $? = 56$

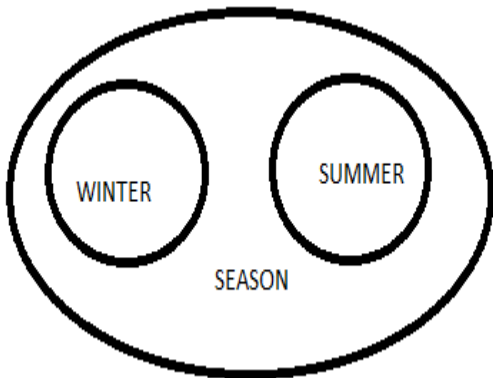
11. Identify the diagram that best represents the relationship among the given classes.

Summer, Season, Winter

- a) 
- b) 
- c) 
- d) 

Answer: A)

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12. Three of the following words are alike in a certain way and one is different. Pick the odd word out.

- a) Helicopter
- b) Train
- c) Parachute
- d) Airplane

Answer: B)

All except 'Train' are means of air transport.

13. Three statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements.

**Statements:**

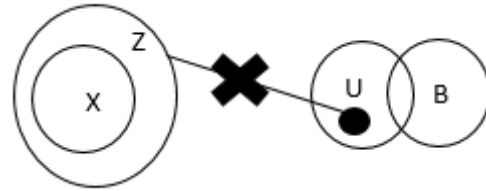
- All X are Z
- Some B are U
- Some U are not Z

**Conclusions:**

- I. Some X are not Z
  - II. All U are X
  - III. Some U is not B
- a) Both I and III follows
  - b) None follows
  - c) All follows

d) Only I and II follows

Answer: B)



I. Some X are not Z → False

II. All U are X → False

III. Some U is not B → False

So, none of the conclusion follows.

14. Which two numbers need to be interchanged to make the given equation correct?

$$12 \div 3 - 6 + 4 \times 96 = 74$$

- a) 6, 4
- b) 12, 96
- c) 3, 6
- d) 6, 96

Answer: B)

b) 12, 96

After interchanging '12, 96', we get:

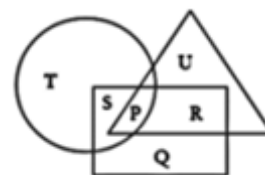
$$\text{L.H.S} = 96 \div 3 - 6 + 4 \times 12$$

$$= 32 - 6 + 48$$

$$= 80 - 6$$

$$= 74 = \text{R.H.S}$$

15. In the venn diagram given below, triangle represents Lawyers, circle represents Engineers and rectangle represents Bankers.



Which letter represents only Lawyers?

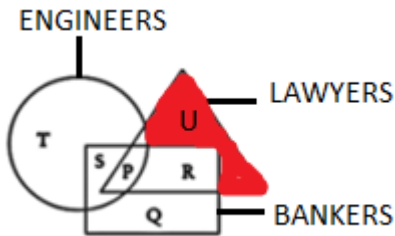
- a) T
- b) U

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c) R

d) Q

Answer: B)



16. In a certain code, 'TURKEY' is written as 'USUOZE'. How is 'PARIS' written in that code?

a) QUYEX

b) QYUEX

c) QYEUX

d) QYVEX

Answer: B)

$$\begin{array}{l} T + 1 = U \\ U - 2 = S \quad P + 1 = Q \\ R + 3 = U \quad A - 2 = Y \\ K + 4 = O \quad R + 3 = U \\ E - 5 = Z \quad I - 4 = E \\ Y + 6 = E \quad S + 5 = X \end{array}$$

17. Looking at a photo, Ananya said, "This man is the eldest son of my mother's mother-in-law". How is Ananya related to the man?

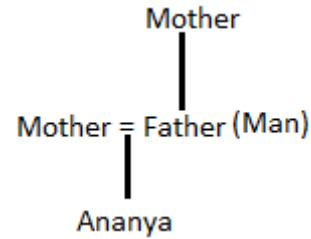
a) Father

b) Daughter

c) Brother

d) Sister

Answer: B)



Ananya is daughter of the man.

18. In the following question, select the missing number from the given series.

3, 9, 12, 21, 33, ?

a) 56

b) 45

c) 44

d) 54

Answer: D)

$$3 + 9 = 12$$

$$9 + 12 = 21$$

$$12 + 21 = 33$$

$$21 + 33 = 54$$

19. The question given below is followed by two arguments. You have to decide which argument is strong in context of the statement.

**Question:**

Should we encourage communal washing centres?

**Arguments:**

I. Yes, it will save a lot of resources.

II. No this concept is new in India because people still wash their clothes in home.

a) Only argument I is strong

b) Only argument II is strong

c) Neither argument I nor argument II is strong

d) Both argument I and II are strong

Answer: A)

20. Find the missing alphanumeric term.

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T25Y, W36V, Z49S, C64P, ?

- a) E81M
- b) F81M
- c) E81N
- d) F81N

Answer: B)

$T + 3 = W$ ;  $W + 3 = Z$ ;  $Z + 3 = C$ ;  $C + 3 = F$

25, 36, 49, 64, **81** (Square series)

$Y - 3 = V$ ;  $V - 3 = S$ ;  $S - 3 = P$ ;  $P - 3 = M$

21. In a certain code, 'fox' is called 'guava', 'guava' is called 'rat', 'rat' is called 'bat', 'bat' is called 'ball' and 'ball' is called 'brush'. In this language, which of the following is known as flying mammal?

- a) Fox
- b) Ball
- c) Rat
- d) Bat

Answer: B)

Flying mammal - Bat

Bat is called Ball.

22. Select the option that will replace the question mark (?) in the given series.

0, 2, 6, 12, 20, ?

- a) 100
- b) 40
- c) 30
- d) 50

Answer: C)

$0 \times 1 = 0$

$1 \times 2 = 2$

$2 \times 3 = 6$

$3 \times 4 = 12$

$4 \times 5 = 20$

$5 \times 6 = 30$

23. In this question, a statement is given followed by four conclusions. Choose the conclusion(s) which best fit(s) logically.

**Statement:**

To pass the examination, one must work hard.

**Conclusions:**

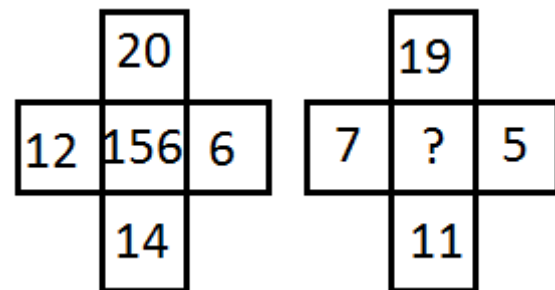
- I. Examination is related to only hard work.
- II. All those who do not work hard pass.
- III. Without hard work, one does not pass.
- IV. Hard-working person is a satisfied person.

- a) Only conclusion III follows
- b) Only conclusions I and II follow
- c) Only conclusion I follows
- d) Only conclusion IV follows

Answer: A)

- I. Examination is related to only hard work. - False
- II. All those who do not work hard pass. - False
- III. Without hard work, one does not pass. - True
- IV. Hard-working person is a satisfied person. - False

24. Find the missing number in the diagram given below.



- a) 56
- b) 123
- c) 78
- d) 105

Answer: C)

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1<sup>st</sup> diagram:  $(12 \times 20) - (14 \times 6) = 240 - 84 = 156$

2<sup>nd</sup> diagram:  $(7 \times 19) - (11 \times 5) = 133 - 55 = 78$

**Direction (25 – 27):** Read the following information and answer the following question.

Six friends A, B, C, D, E and F are sitting in a park. A and B are from red house, while remaining all are from green house. D and F are tall in height while others are small. A, C and D are wearing goggles, while others are not.

25. Which of the two friends are not wearing goggles and short in height?

- a) A and F
- b) C and E
- c) B and E
- d) E and F

Answer: C)

	Red House	Green House	Tall	Short	Goggle
<b>Yes</b>	A, B	C, D, E, F	D, F	A, B, C, E	A, C, D
<b>No</b>	C, D, E, F	A, B	A, B, C, E	D, F	B, E, F

26. Which of the following person of green house is not wearing goggle?

- a) B
- b) C
- c) D
- d) F

Answer: D)

	Red House	Green House	Tall	Short	Goggle
<b>Yes</b>	A, B	C, D, E, F	D, F	A, B, C, E	A, C, D

<b>No</b>	C, D, E, F	A, B	A, B, C, E	D, F	B, E, F
-----------	------------	------	------------	------	---------

27. Which of the following person is not wearing goggle and is short in height?

- a) F
- b) D
- c) B
- d) A

Answer: C)

	Red House	Green House	Tall	Short	Goggle
<b>Yes</b>	A, B	C, D, E, F	D, F	A, B, C, E	A, C, D
<b>No</b>	C, D, E, F	A, B	A, B, C, E	D, F	B, E, F

28. An assertion (A) and a reason (R) are given below.

**Assertion (A):** The leakage in the gas cylinders can be known.

**Reason (R):** The odour of the LPG is very intense.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true, but R is not the correct explanation of A.
- c) A is true, but R is false.
- d) A is false, but R is true.

Answer: C)

A is true, but R is false.

29. Rearrange the jumbled letters to form a meaningful word and then select which one is different.

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- a) EARSUQ
- b) ONGPOYL
- c) NAGERCELT
- d) BMUSHRO

Answer: B)

- a) EARSUQ → SQUARE
- b) ONGPOYL → POLYGON
- c) NAGERCELT → RECTANGLE
- d) BMUSHRO → RHOMBUS

All options except 'ONGPOYL' are geometrical figures which have four sides.

30. Find the pair which is similar as given relation.

9 : 27 :: \_\_\_ : \_\_\_

- a) 5 : 125
- b) 8 : 64
- c) 15 : 135
- d) 81 : 729

Answer: D)

9 : 27 →  $3^2$  :  $3^3$

Similarly,

81 : 729 →  $9^2$  :  $9^3$

### General knowledge

1) Swachh Bharat Abhiyan, a country-wide campaign was initiated by the Government of India in which year?

- a) 2014
- b) 2018
- c) 2015
- d) 2017

Answer: A

Swachh Bharat Abhiyan campaign was launched on 2 October 2014 on birth anniversary of Mahatma Gandhi. It aimed to eradicate open defecation by 2

October 2019, the 150th anniversary of the birth of Mahatma Gandhi.

2) What is full form of OLED ?

- a) Organic Light Emitted Diode
- b) Organic Light Emitting Diode
- c) Organ Light Emitting Diode
- d) Original Light Emitting Diode

Answer: B

OLED (Organic Light Emitting Diodes) is a flat light emitting technology, made by placing a series of organic thin films between two conductors. When electrical current is applied, a bright light is emitted.

3) What is the theme of the 'World Environment Day' 2020?

- a) "Beat Air Pollution".
- b) "Time for Nature"
- c) "Beat Plastic Pollution"
- d) "Go wild for life"

Answer: B

World Environment Day (WED) is celebrated on 5 June every year. The theme for World Environment Day 2020 is, 'Time for Nature,' with a focus on its role in providing the essential infrastructure that supports life on Earth and human development.

4) Veto power is in the hands of how many countries?

- a) Four
- b) Three
- c) Five
- d) Eleven

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**Answer: C**

The United Nations Security Council "veto power" refers to the power of the five permanent members of the UN Security Council (China, France, Russia, the United Kingdom and the United States) to veto any "substantive" resolution.

**5) Aryabhata, India's first satellite was launched in which year?**

- a) 1971
- b) 1978
- c) 1975
- d) 1981

**Answer: C**

Aryabhata was India's first satellite which was named after the famous Indian astronomer. It was launched on 19 April 1975 and was built by the ISRO.

**6) Beti Bachao Beti Padhao (BBBP) was launched by the Prime Minister Narendra Modi on\_\_\_\_\_.**

- a) 15 January, 2017
- b) 22 January, 2015
- c) 11 January, 2014
- d) 31 January, 2018

**Answer: B**

Beti Bachao, Beti Padhao is a campaign of the Government of India that aims to generate awareness and improve the efficiency of welfare services intended for girls in India. It was launched on 22nd January, 2015 at Panipat, Haryana.

**7) Which is the cleanest city in India according to India's cleanest cities 2020 list?**

- a) Pune
- b) Indore
- c) Kolkata
- d) Gandhinagar

**Answer: B**

According to India's cleanest cities 2020 list, Indore has emerged as the cleanest city in the country. It has grabbed the prestigious Swachh Survekshan award for four times in a row.

**8) Who among the following is the founder of Facebook?**

- a) Doug McMillon
- b) Mark Zuckerberg
- c) Elon Musk
- d) Jack Dorsey

**Answer: B**

Facebook is an American technology conglomerate based in Menlo Park, California. It was founded by Mark Zuckerberg.

**9) Tarapur atomic power station, India's first nuclear power plant is located in\_\_\_\_\_.**

- a) Andhra Pradesh
- b) Bihar
- c) Maharashtra
- d) Tamil Nadu

**Answer: C**

The Tarapur Atomic Power Station (TAPS) located near Boisar, Maharashtra, is the oldest nuclear power plant in India. It is owned and operated by the

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state-run Nuclear Power Corporation of India (NCPIL).

10) The National Aeronautics and Space Administration (NASA), an independent agency was established in\_\_\_\_\_.

- a) 1958
- b) 1955
- c) 1961
- d) 1965

**Answer: A**

The National Aeronautics and Space Administration is an independent agency of the U.S. federal government responsible for the civilian space program, as well as aeronautics and space research. It was established in 1958.

11) What is the S.I unit of Force?

- a) Weber
- b) Newton
- c) Tesla
- d) Gauss

**Answer: B**

The newton is the International System of Units (SI) derived unit of force. It is named after Isaac Newton.

12) According to National Statistical Office survey, which is the most literate state in India?

- a) Kerala
- b) Punjab
- c) Haryana
- d) Rajasthan

**Answer: A**

Kerala is the most literate state in India, with a 96.2% literacy rate, according to a report based on a National Statistical Office survey. After Kerala, Delhi has the highest literacy rate in the country at 88.7%.

13) Who was the president of the Ghadar Party, an Indian revolutionary organization founded by Indians?

- a) Kartar Singh Sarabha
- b) Bhagwan Singh Gyaneer
- c) Gulab Kaur
- d) Sohan Singh Bhakna

**Answer: D**

The Ghadar Party was an Indian revolutionary organisation primarily founded by Indians in the year 1913. The party was multi-ethnic and had Sikh, Hindu and Muslim leaders. Sohan Singh Bhakna was the President of the Ghadar Party.

14) Who among the following was the leader of the Bardoli Satyagraha of 1928?

- a) Pandit Jawaharlal Nehru
- b) Mahatma Gandhi
- c) Sardar Vallabhbhai Patel
- d) Dr. Rajendra Prasad

**Answer: C**

The Bardoli Satyagraha of 1928, in the state of Gujarat, India during the period of the British Raj, was a major episode of civil disobedience and revolt in the Indian Independence Movement. The movement was eventually led by Vallabhbhai Patel, and its success gave rise to Patel becoming one of the main leaders of the independence movement.



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**15) Indian National Congress was formed in which year?**

- a) 1888
- b) 1881
- c) 1895
- d) 1885

**Answer: D**

The Indian National Congress was considered to be the largest and most prominent Indian public organization, as well as the central and defining influence of the long Indian Independence Movement. A.O Hume is known as the father of the Indian national congress who laid its foundation in the year 1885.

**16) What is the chemical formula of Methane?**

- a)  $\text{CH}_3\text{COOH}$
- b)  $\text{CH}_4$
- c)  $\text{CHCl}_3$
- d)  $\text{C}_2\text{H}_5\text{OH}$

**Answer: B**

Methane is a chemical compound with the chemical formula  $\text{CH}_4$ . It is the simplest alkane, and is the main constituent of natural gas.

**17) Who among the following was the First president of the Indian National Congress?**

- a) Allan Octavian Hume
- b) Bal Gangadhar Tilak
- c) Womesh Chandra Banerjee
- d) Mahatma Gandhi

**Answer: C**

The Indian National Congress is a broadly-based political party in India founded in 1885. Womesh Chandra Banerjee was the first president of Congress and the first session was attended by 72 delegates.

**18) Fundamental duties are mentioned in which of the following part of Indian Constitution?**

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

**Answer: C**

According to Article 51 A of Indian Constitution, there are 11 Duties for the Citizens of India which are termed as Fundamental Duties. Ten duties in the Indian Constitution were included in the Indian Constitution by 42nd amendment act, 1976 on the basis of Swaran Singh Committee set up by congress party. Eleventh duty was added by 86th Amendment act, 2002.

**19) How many member countries are there in SAARC?**

- a) Eight
- b) Eleven
- c) Nine
- d) Five

**Answer: A**

The South Asian Association for Regional Cooperation (SAARC) is the regional intergovernmental organization and geopolitical union of states in South Asia. There are eight member countries in SAARC namely Afghanistan,

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Bangladesh, Bhutan, India, Nepal, Maldives, Pakistan and Sri Lanka.

**20) Which government scheme is registered in Guinness Book of World Records?**

- a) Pradhan Mantri Kisan Maan Dhan Yojana
- b) Atmanirbhar Bharat Abhiyan.
- c) Atal Pension Yojana
- d) PAHAL scheme

**Answer: D**

The Direct Benefit Transfer of LPG or PAHAL scheme, has been acknowledged by the Guinness Book of World records as the largest cash transfer programme in terms of number of households.

**21) Who among the following was the Governor-General of India in 1912?**

- a) Lord Hardinge
- b) Warren Hastings
- c) Lord Minto
- d) Lord Canning

**Answer: A**

Charles Hardinge was a British diplomat and statesman who served as Viceroy and Governor-General of India from 1910 to 1916.

**22) Which of the following state does not have the State Legislative Council?**

- a) Bihar
- b) Uttar Pradesh
- c) Maharashtra
- d) Kerala

**Answer: D**

The State Legislative Council, is the upper house that have a bicameral state legislature; the lower house being the State Legislative Assembly. As of January 2020, 6 out of 28 states have a State Legislative Council.

**23) Which one of the following is a Metalloid?**

- a) Iron
- b) Copper
- c) Nickel
- d) Germanium

**Answer: D**

The elements which possess the characteristics of both metals and non-metals are called as metalloids. The six commonly recognised metalloids are boron, silicon, germanium, arsenic, antimony, and tellurium.

**24) The state of Telangana was officially formed on \_\_\_\_\_.**

- a) 2 June 2014
- b) 5 May 2015
- c) 16 June 2017
- d) 21 August 2016

**Answer: A**

Telangana is a state in India situated on the south-central stretch of the Indian peninsula on the high Deccan Plateau. It was officially formed on 2 June 2014.

**25) Aditya-L1, a spacecraft mission to study the Sun is planned to be launched by ISRO in which year?**

- a) 2021

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- b) 2025
- c) 2023
- d) 2022

**Answer: D**

Aditya-L1 is a spacecraft mission to study the Sun. It has been designed and will be built in collaboration between the Indian Space Research Organisation and various Indian research institutes. It is planned to be launched in January 2022. It is India's first solar mission.

**26) Which one of the following is an Abiotic factor?**

- a) Fungi
- b) Bacteria
- c) Algae
- d) Temperature

**Answer: D**

Abiotic factors are all nonliving components of an ecosystem. Some examples of abiotic factors are water, soil, air, sunlight, temperature, and minerals.

**27) Which among the following organ is connected to Spinal Cord?**

- a) Brain
- b) Lungs
- c) Liver
- d) Heart

**Answer: A**

The base or lower part of the brain is connected to the spinal cord. Together, the brain and spinal cord are known as the central nervous system (CNS). Many nerves send electrical signals to and from the brain and spinal cord.

**28) Which one of the following belongs to Kingdom Animalia?**

- a) Amoeba
- b) Mushroom
- c) Human
- d) Mold

**Answer: C**

The Kingdom Animalia is a large group that consists of eukaryotic, multicellular organisms that are heterotrophic in nature. Humans belong to Kingdom Animalia.

**29) The First Round Table Conference held on November 12, 1930 was chaired by whom?**

- a) Lord Sankey
- b) Arthur Henderson
- c) George V
- d) Ramsay MacDonald

**Answer: D**

First Round Table Conference was first among the three such conferences organized between 1930 and 1932 by British government. It was officially inaugurated on November 12, 1930 at House of Lords at London by the British King (George V) and was chaired by then British Prime Minister Ramsay MacDonald.

**30) The Bharat Ratna, highest civilian award of the Republic of India was instituted in which year?**

- a) 1954

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- b) 1958
- c) 1961
- d) 1965

**Answer: A**

The Bharat Ratna is the highest civilian award of the Republic of India. Instituted on 2 January 1954, the award is conferred in recognition of exceptional service of the highest order, without distinction of race, occupation, position, or sex.

**31) Name the Prime Minister who laid the foundation stone of The Golden Quadrilateral project?**

- a) Atal Bihari Vajpayee
- b) Manmohan Singh
- c) Vishwanath Pratap Singh
- d) Rajiv Gandhi

**Answer: A**

The Golden Quadrilateral (GQ) is a national highway network connecting most of the major industrial, agricultural and cultural centres of India. Prime Minister Atal Bihari Vajpayee laid the foundation stone for the project on 6 January 1999.

**32) Doctrine of lapse was devised by which of the following Governor-General?**

- a) Lord Hardinge
- b) Warren Hastings
- c) Lord Dalhousie
- d) Lord Canning

**Answer: C**

The doctrine of lapse was an annexation policy applied by the British East India Company in India until 1859. The policy is most commonly associated

with Lord Dalhousie, who was the Governor General of the East India Company in India between 1848 and 1856.

**33) The Total Membership of Rajya Sabha is limited to how many members as per the Indian Constitution?**

- a) 230
- b) 245
- c) 250
- d) 300

**Answer: C**

The Rajya Sabha or Council of States is the upper house of the Parliament of India. Membership of Rajya Sabha is limited by the Constitution to a maximum of 250 members and current laws have provision for 245 members.

**34) UNESCO, a specialised agency of the United Nations is headquartered in\_\_\_\_\_.**

- a) Geneva, Switzerland
- b) Paris, France
- c) London, United Kingdom
- d) Vienna, Austria

**Answer: B**

The United Nations Educational, Scientific and Cultural Organization is a specialised agency of the United Nations (UN) aimed at promoting world peace and security through international cooperation in education, the sciences, and culture. It is headquartered in Paris, France.

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35) Which one of the following is the capital of Manipur?

- a) Jaipur
- b) Patna
- c) Imphal
- d) Dispur

**Answer: C**

Manipur is a state in northeastern India, with the city of Imphal as its capital. It is bounded by the Indian states of Nagaland to the north, Mizoram to the south and Assam to the west.

36) Who among the following is the CEO of IBM?

- a) Arvind Krishna
- b) Dinesh Paliwal
- c) Shantanu Narayen
- d) Salil Parekh

**Answer: A**

Arvind Krishna is an Indian-American business executive. He is the CEO of IBM since April 2020.

37) Name the author of the book 'Every child matters'?

- a) Nadia Murad
- b) Kailash Satyarthi
- c) Aravind Adiga
- d) Arundhati Roy

**Answer: B**

Kailash Satyarthi is an Indian social reformer who campaigned against child labour in India and advocated the universal right to education. He has authored the book 'Every child matters'.

38) Which among the following is a Secondary Pollutant?

- a) carbon monoxide
- b) nitrogen oxide
- c) sulfur oxide
- d) Ozone

**Answer: D**

Ground-level ozone is a colorless and highly irritating gas that forms just above the earth's surface. It is called a secondary pollutant because it is produced when two primary pollutants react in sunlight and stagnant air. These two primary pollutants are nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOCs).

39) Human Rights Day is celebrated annually across the world on \_\_\_\_\_ every year.

- a) 10<sup>th</sup> December
- b) 19<sup>th</sup> September
- c) 22<sup>nd</sup> February
- d) 15<sup>th</sup> August

**Answer: A**

Human Rights Day is celebrated annually across the world on 10 December every year. The day commemorates the United Nations General Assembly adoption of the Universal Declaration of Human Rights (UDHR) in 1948.

40) Bhangra, a type of traditional dance of the Indian subcontinent originated in \_\_\_\_\_.

- a) Madhya Pradesh
- b) Gujarat
- c) Punjab

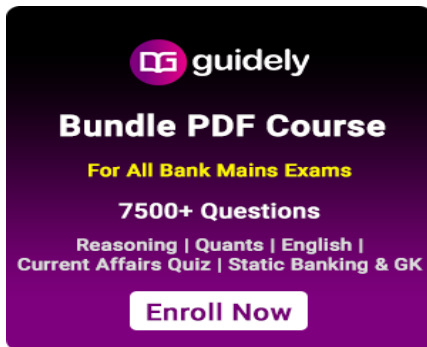
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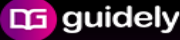
d) Haryana

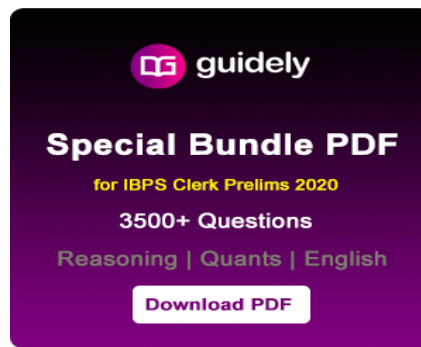
**Answer: C**


Bhangra is a type of traditional dance of the Indian subcontinent, originating in Sialkot in the Majha area

of Punjab. The dance was associated primarily with the spring harvest festival Baisakhi.



  
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