

1. What is the value of  $(888 - 88 + 8) \div 8$  ?

$$= (800 + 8) \div 8$$

$$= 808 \div 8$$

$$= 101$$

ANSWER: D) 101

- A) 81                      B) 88                      C) 100                      **D) 101**                      E) 108

2.  $\frac{20+21}{2+0+2+1} = ?$

$$= \frac{41}{5} = \frac{82}{10} = 8,2$$

ANSWER: B) 8,2

- A) 8,1                      **B) 8,2**                      C) 8,5                      D) 4,1                      E) 4,2

3. Some birds were flying and met a bird on their way. The bird greeted them, hello hundred! They said we are not hundred, we need half of us plus you to make us hundred. How many birds were flying?

Since 66

$$66 + \frac{66}{2} + 1 = 100$$

ANSWER: C) 66

- A) 50                      B) 80                      **C) 66**                      D) 99                      E) 108

4. Figure has unit cubes. Find the number of unit cubes below figure?

Number of cubes layer by layer

Layer1:  $5 \times 3 = 15$  cubes

Layer2:  $5 \times 2 = 10$  cubes

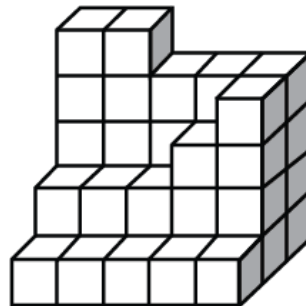
Layer3:  $(5 \times 1) + (2 \times 1) = 7$

Layer4:  $(5 \times 1) + (1 \times 1) = 6$

Layer5:  $2 \times 1 = 2$

Total =  $15 + 10 + 7 + 6 + 2 = 40$

ANSWER: A) 40



- A) 40**                      B) 36                      C) 32                      D) 28                      E) 44

5. Which one is the half of  $2^8$  ?

$$2^8 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 256, \text{ Half of } 256 \text{ is } 128, 128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^7$$

ANSWER: D)  $2^7$

- A)  $2^4$                       B) 1                      C) 32                      **D)  $2^7$**                       E) 64

6. If seven web programmers can format 1001 puzzles in 429 minutes, how long does it take three web programmers to format those 1001 puzzles?

7 persons solve 1001 puzzles in 429 minutes then 1 person solves 1001 puzzles in  $429 \times 7$  minutes  
Then three programmers solve 1001 puzzles in  $429 \times 7 / 3 = 143 \times 7 = 1001$  minutes .

Answer : A) 1001

- A) 1001      B) 429      C) 143      D) 403      E) 33

7. If today is Thursday, what day is it 500 days after today?

500 is divided by 7 so remainder is 3 (497 is divisible by 7) so the day is Sunday

Answer: E) Sunday

- A) Saturday      B) Friday      C) Monday      D) Thursday      E) Sunday

8. There are some cats and some hens in the yard. You counted that they have 18 heads and 58 legs total. Find the difference of the numbers of cats and hens?

Assume all are cats then number of legs is  $18 \times 4 = 72$

so we have  $72 - 58 = 14$  more legs

that coming from hens in which each hens got 2 more legs

then number of legs is  $14 / 2 = 7$  hend

then  $18 - 7 = 11$  cats .

difference =  $11 - 7 = 4$

Answer: B) 4

- A) 2      B) 4      C) 6      D) 8      E) 10

9. I have seven pairs of socks in my drawer, one of each color of the rainbow. How many socks do I have to draw out in order to guarantee that I have grabbed at least one pair?

After grabbing 7 socks, worst case scenario, I have grabbed a sock of each color.

Thus, after grabbing one more sock,

it has to match up with one of the previous socks

so after grabbing 8 socks I am guaranteed to have a same color of pair.

Answer: C) 8

- A) 3      B) 7      C) 8      D) 11      E) 14

10. Five people were eating apples, A finished before B, but behind C. D finished before E, but behind B. What was the finishing order from first to last?

Putting the first three in order, A finished in front of B but behind C, so CAB.

Then, we know D finished before B, so CABD. We know E finished after D, so CABDE.

Answer: E) CABDE

- A) CABDE      B) CADBE      C) CABED      D) CDEAB      E) CABDE

# PART – 2

5 marks each

11. What is the least number of cuts required to cut a cube into 24 identical pieces?

From figure on the side;

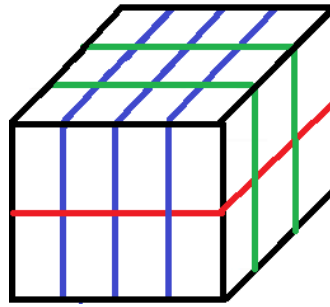
3 vertical(blue) cuts

1 horizontal(red) cut

2 green cuts

All add up to 6 cuts

Answer: B) 6



A) 7

B) 6

C) 5

D) 4

E) 3

12. 2021 is a number which is written with two consecutive numbers follow each other. Find the number of natural numbers less than 2021 which can be written with consecutive 2 or 3 or 4 numbers like 78, 345, 910 or 1516.

12, 23, 34, 45, 56, 67, 78, 89, 910, 1011, 1112, 1213, 1314, 1415, 1516, 1617, 1718, 1819, 1920, 123, 234, 345, 456, 567, 678, 789, ~~8910~~, 1234, ~~2345~~

Total is 27

Answer: A) 27

A) 27

B) 26

C) 19

D) 20

E) 23

13. The speed of the bicycle is 90 km/hr, what is its speed in metre/minute?

90 km in 1 hour then 90 000 metres in 60 minutes and then in 1 minute  $\frac{90000}{60} = 1500 \text{ m/min}$

Answer: D) 1500 m/min

A) 25 m/min

B) 45 m/min

C) 15000 m/min

D) 1500 m/min

E) 100 m/min

14. The points A, F and E are on the straight line. The measure of angle (DEF) =  $24^\circ$  FC and FB bisects the angle (AFD) and angle (AFC), respectively.

Which one is equal to angle (BFD)?

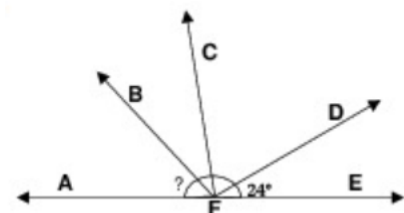
$$180 - 24 = 156$$

$$156 \div 2 = 78$$

$$78 \div 2 = 39$$

$$BFD = 78 + 39 = 117$$

Answer: C) 117



A) 78

B) 102

C) 117

D) 63

E) 156

15. Using the digits 2, 9, 3, 6 and 0 form the largest and the smallest possible 5-digit numbers each has different digits. Find the difference between these two numbers formed.

Biggest = 96 320; smallest 20369. Then difference =  $96\ 320 - 20\ 369 = 75\ 951$

Answer: A) 75951

- A) 75951                      B) 72630                      C) 66690                      D) 70263                      E) 62690

16. How many minutes are there in 1% of a year?

$$365 \times 24 \times 60 = 525600$$

1% of 525600 is 5256

Answer: B) 5256

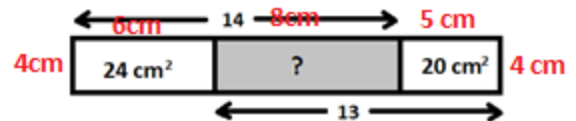
- A) 1440                      B) 5256                      C) 2190                      D) 4648                      E) 8760

17. Calculate area of shaded rectangle.

$\frac{24}{20} = \frac{6}{5}$  so lengths as on the figure on the side.

$$\text{Area} = 8 \times 4 = 32$$

Answer: B) 32



- A) 30                      B) 32                      C) 40                      D) 44                      E) 58

18. In numbering the pages of a book digit 9 was used 100 times. Which one can be the total number of pages of this book?

1 to 9, It used onces

10 to 99, 19 times

100 to 199, 20 times

200 to 299, 20 times

300 to 399, 20 times

400 to 499, 20 times, so total is 100 times

Answer can be between 500 to 599 and smallest one

Answer: A) 506

- A) 506                      B) 400                      C) 605                      D) 498                      E) 550

19.  $5+7+9+\dots+33$  is subtracted from  $6+8+10+\dots+34$ . The answer is

$$6 + 8 + 10 + \dots + 32 + 34$$

$$5 + 7 + 9 + \dots + 31 + 33 \quad \text{whem each subrated vertically}$$

$$1 + 1 + 1 + \dots + 1 + 1 = 29$$

Answer: A) 29

- A) 29                      B) 28                      C) 17                      D) 16                      E) 15

20. The letters of STAR will be rearranged. What is the probability of that the new combination of letters has T and A in the middle?

**All arrangements:  $4 \times 3 \times 2 \times 1 = 24$**

**STAR, SATR, RTAS, RATS is 4**

$$\frac{4}{24} = \frac{1}{6}$$

**Answer: B)  $\frac{1}{6}$**

A)  $\frac{1}{2}$

**B)  $\frac{1}{6}$**

C)  $\frac{1}{8}$

D)  $\frac{1}{2}$

E)  $\frac{1}{3}$

## PART – 3

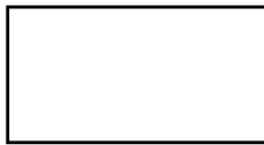
6 marks each

21. The width of a rectangular piece of paper is half of its length.

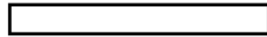
Shape A is formed when this paper is folded horizontally 6 times, its width gets shorter but the length does not change.

Shape B is formed when this paper is folded vertically 4 times, its length gets shorter but the width does not change.

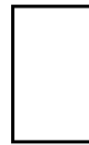
If the perimeter of shape A is 52 cm, then determine the area of shape B.



Original Rectangle



Shape A



Shape B

**Steps:  $x \Rightarrow 6x \Rightarrow 12x \Rightarrow 3x$**

**Perimeter for Shape A:  $2(x + 12x) = 52$ ,  $26x = 52$ ,  $x = 2$**

**Area of shape B:  $3x \times 6x = 6 \times 12 = 72$**

**Answer: E)  $72 \text{ cm}^2$**

A)  $96 \text{ cm}^2$

B)  $192 \text{ cm}^2$

C)  $48 \text{ cm}^2$

D)  $144 \text{ cm}^2$

**E)  $72 \text{ cm}^2$**

22. The dots will be joined to draw a triangle.

How many different triangles can be drawn using any 3 of these 8 dots?

From A and two of XYZW

AXY, AYZ, AZW, AXZ, AYW, AXW so 6 triangles

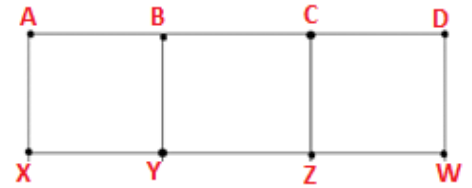
Same for B, C, D  $\Rightarrow 6 \times 4 = 24$

From X and two of ABCD

Same for Y, Z, W  $\Rightarrow 6 \times 4 = 24$

So  $24 + 24 = 48$

Answer: A) 48



A) 48

B) 36

C) 32

D) 24

E) 12

23. Two dice are thrown. What is the probability of having the sum of the two top face values to be an even number while the product of the two top face values is an odd number?

Top faces: odd & odd

1,1 3,1 5,1

1,3 3,3 5,3

1,5 3,5 5,5 so total is 9

All possibilities are 36, probability is  $\frac{9}{36} = \frac{1}{4}$

Answer:

A)  $\frac{5}{36}$

B)  $\frac{1}{10}$

C)  $\frac{1}{4}$

D)  $\frac{5}{13}$

E)  $\frac{13}{36}$

24. 2021 is divided by a natural number leave the remainder 11. Determine the number of such natural numbers?

$$2021 = a \times b + 11$$

$$2010 = a \times b$$

$$1 \times 2010$$

$$5 \times 402$$

$$15 \times 132$$

$$2 \times 1005$$

$$6 \times 335$$

$$30 \times 67$$

$$3 \times 670$$

$$10 \times 201$$

10 of them are more than 10

Answer: D) 10

A) 15

B) 12

C) 11

D) 10

E) 8

25.  $a, b, c$  are whole numbers and  $\frac{a \times b + 11}{c} = 8$ . Which of the following is always true?

$a \times b + 11 = 8 \times c$  so  $8 \times c$  is always an even number

Then  $a \times b + 11$  must be an even number.

11 is an odd number

An odd number + an odd number = an even number

Then  $a \times b$  must be an odd number

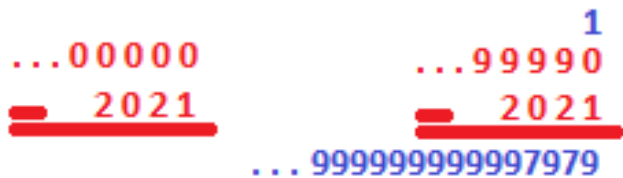
There is only one option  $odd \ number \times \ odd \ number = \ even \ number$

Therefore  $a$  and  $b$  both should be odd numbers.

Answer:  $a$  and  $b$  are odd numbers

- A)  $c$  is an odd number
- B)  $c$  is an even number
- C)  $a$  is an odd,  $c$  is an even number
- D)  $a$  and  $b$  are odd numbers**
- E)  $a$  and  $b$  are even numbers

26. Find the sum of the last 15 digits of the difference  $10^{2021} - 2021$ .



- A) 143
- B) 141
- C) 137
- D) 35
- E) 131**

27. Find the sum of  $a, b, c, d, e, f, g,$  and  $h$ .

$K = a + b$

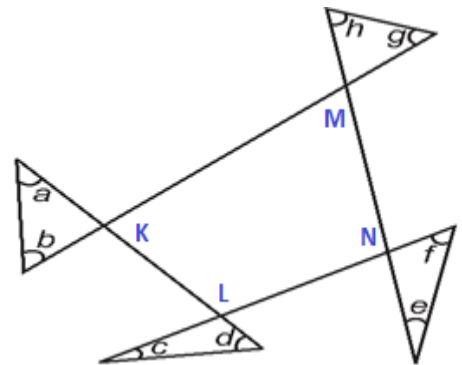
$L = c + d$

$N = e + f$

$M = h + g$

$K + L + M + N = 360$  Sum of interior angles in quadrilateral

Answer: D) 360



- A) 900
- B) 720
- C) 540
- D) 360**
- E) 180

28. If the sides meet corners at  $90^\circ$ , then find the perimeter of shape.

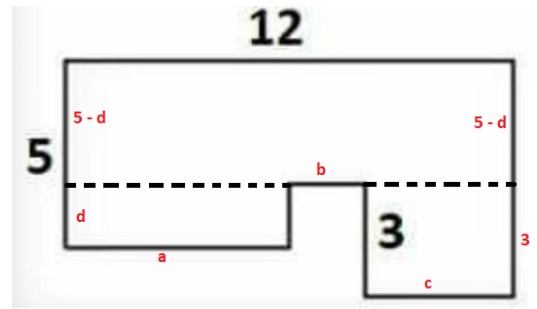
According to letter located on the figure on the side;

$$a + b + c = 12$$

$$5 + d + 3 + 5 - d + 3 = 16$$

$$\text{Perimeter} = 16 + 2 \times 12 = 40$$

Answer: E) 40



- A) 36                      B) 44                      C) 30                      D) 46                      **E) 40**

29. How many different routes are there from A to C with or without passing through B moving along the routes in the direction of arrows?

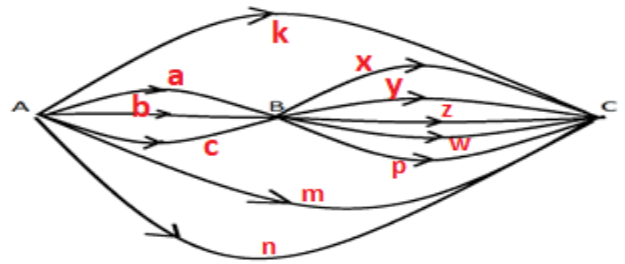
A & B      B & C      A & C

$$3 \times 5 + 3$$

$$= 15 + 3$$

$$= 18$$

Answer: C) 18



- A) 11                      B) 15                      **C) 18**                      D) 30                      E) 45

30. There are two candles of the same length of 60cm and same size. Both of them burn at a uniform rate. The first one burns in 5 hours and the second one burns in 3 hours. Both candles are lit together. After how many minutes the length of the first candle is 3 times that of the other?

	First	Second
After 90 minutes	$60 - \frac{60}{5 \times 60} \times 90 = 42$	$60 - \frac{60}{3 \times 60} \times 90 = 30$
After 120 minutes	$60 - \frac{60}{5 \times 60} \times 120 = 36$	$60 - \frac{60}{3 \times 60} \times 120 = 20$
After 135 minutes	$60 - \frac{60}{5 \times 60} \times 135 = 33$	$60 - \frac{60}{3 \times 60} \times 135 = 15$
<b>After 150 minutes</b> <b>Correct answer(30 = 3 × 10)</b>	<b><math>60 - \frac{60}{5 \times 60} \times 150 = 30</math></b>	<b><math>60 - \frac{60}{3 \times 60} \times 150 = 10</math></b>
After 165 minutes	$60 - \frac{60}{5 \times 60} \times 165 = 27$	$60 - \frac{60}{3 \times 60} \times 165 = 5$

- A) 90                      B) 120                      C) 135                      **D) 150**                      E) 165

THE END

