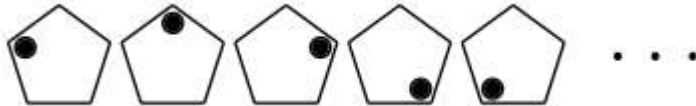


LEVEL 2 CHALLENGE GRADE 6 AND 7 ROUND ONE **ANSWERS**

1. **D** 12 copies in 5 seconds.
 $12 \times 12 = 144$ copies in $5 \times 12 = 60$ seconds = 1 minute.
 $\therefore 144 \times 4 = 576$ copies in 240 seconds = 4 minutes.

2. **C** The pattern repeats itself every five figures.



The closest multiple of 5 to 2016 is 2015. Therefore, the 2016th figure will be



3. **D** The prime numbers less than 13 are $\{2, 3, 5, 7, 11\}$. $\therefore 2 + 3 + 5 + 7 + 11 = 28$.

4. **E** Clearly, the only days that can occur 5 times in this particular month is Monday, Tuesday and Sunday. From the options given, only Sunday is correct.

MON	TUE	WED	THURS	FRI	SAT	SUN
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

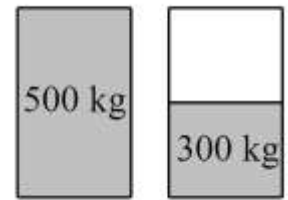
5. **A** For a number to be divisible by 3, the sum of all the digits of that number must be divisible by 3.

$1 + 2 + 3 + 4 + 5 = 15$. As such, numbers that would be divisible by 3 would be 15, 18, 21 and 24. Since P cannot be greater than 9, the sum of $1 + 2 + 3 + 4 + 5 + P$ cannot be greater than $15 + 9 = 24$.

Therefore, there are 4 numbers like 12345P that are divisible by 3.

6. B $99 \times 1000 = 99000$.
 $\therefore 99 \times 999 = 99 \times 1000 - 99 = 99000 - 99 = 98901$.

7. D Since the full container is 500 kg and a half full container is 300 kg, the empty container will weigh $\frac{500 - 300}{2} = 100$ kg.



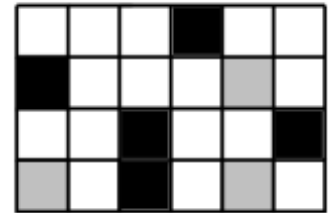
8. A There are $4 \times 6 = 24$ squares.

Shaded squares : Unshaded squares = 1 : 2.

$$\frac{24}{3} = 8 \Rightarrow \text{Shaded squares : Unshaded squares} = 8 : 16.$$

Currently there are 5 shaded squares : 19 unshaded squares.

Therefore, 3 more squares must be shaded.



9. B $3 \div \frac{2}{3} = 3 \times \frac{3}{2} = \frac{9}{2} = 4\frac{1}{2}$

10. B

$$\frac{36}{45} = \frac{A}{5}$$

$$45 \div 9 = 5 \Rightarrow 36 \div 9 = 4 = A$$

$$\frac{36}{45} = \frac{12}{B}$$

$$36 \div 3 = 12 \Rightarrow 45 \div 3 = 15 = B$$

$$\frac{36}{45} = \frac{8}{C}$$

$$36 \div 8 = \frac{9}{2}$$

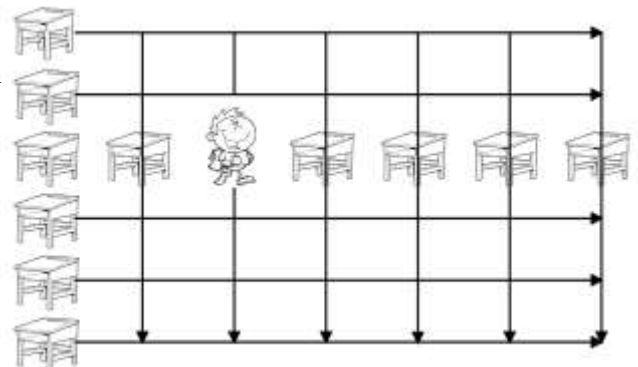
$$\therefore A + B + C = 4 + 15 + 10 = 29$$

$$\therefore C = 45 \div \frac{9}{2} = 45 \times \frac{2}{9} = 10$$

11. D Since Sanjeev is in the third row from the front and fourth from the back there is $3 + 4 - 1 = 6$ rows.

Since Sanjeev is third from the left and fifth from the right, there $3 + 5 - 1 = 7$ columns.

Therefore, there are $6 \times 7 = 42$ desks.

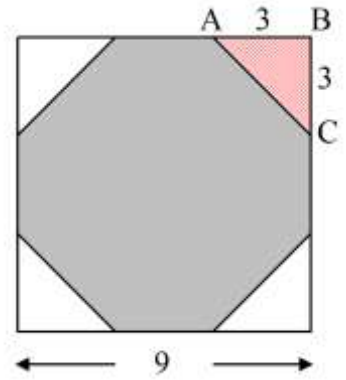


12. C Since the area of the square is 81 cm^2 , the side length of the square is $\sqrt{81} = 9 \text{ cm}$.

The area of $\triangle ABC = \frac{1}{2} \times 3 \times 3 = \frac{9}{2}$.

Therefore, the area of the shaded region will be

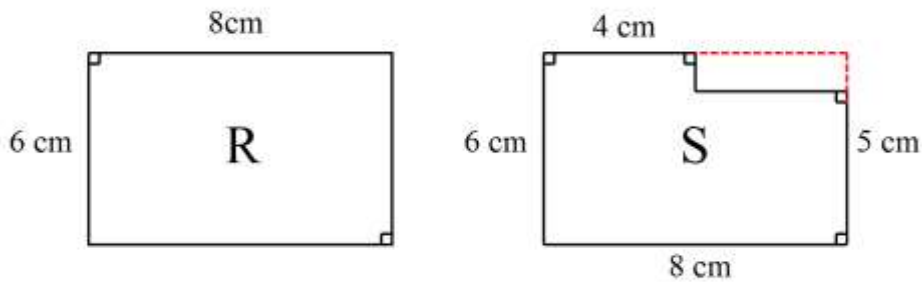
$81 - 4 \times \frac{9}{2} = 81 - 18 = 63 \text{ cm}^2$.



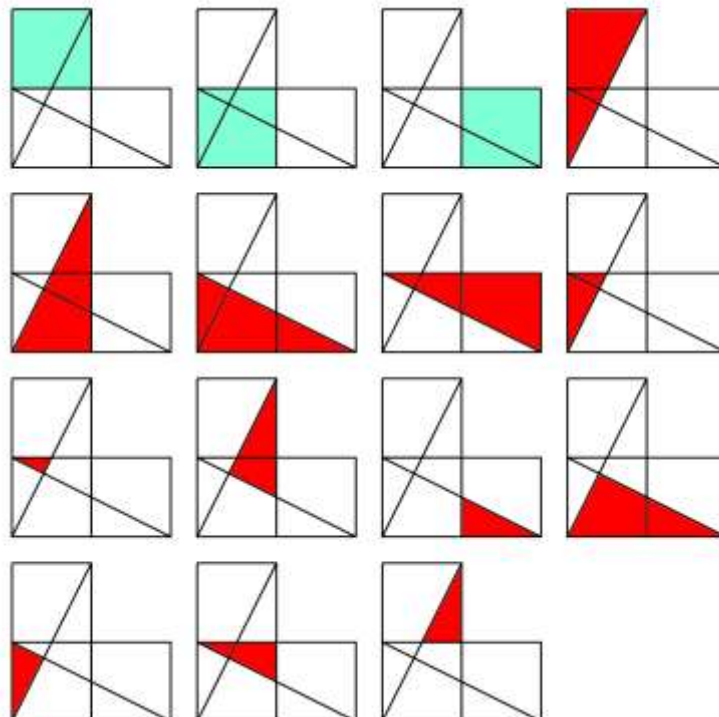
13. B From $1 - 9 = 9$ digits.
 From $10 - 99 = 90 \times 2 = 180$ digits.
 From $100 - 999 = 900 \times 3 = 2700$ digits.
 From $1000 - 1999 = 1000 \times 4 = 4000$ digits.
 From $2000 - 2016 = 17 \times 4 = 68$ digits.

Therefore, there will be $9 + 180 + 2700 + 4000 + 68 = 6957$ digits written in total.

14. E Figure S will clearly have a smaller area from figure R. Despite the cut out, figure R and S will have the same perimeter. Immediately, all statements can be ignored except E.



15. E There are 3 squares and 12 triangles of various sizes.
 The maximum amount of points that can be awarded is $(3 \times 3) + (12 \times 2) = 33$.



16. B $(4 \uparrow) = 4 + 2 = 6$ and $(5 \downarrow) = 5 - 3 = 2$.
 $\therefore (4 \uparrow) \times (5 \downarrow) = 6 \times 2 = 12 = 10 \uparrow$.

17. C $2^1 = 2, 2^2 = 4, 2^3 = 8, 2^4 = 16, 2^5 = 32, \dots$

The unit's digits of powers of 2 will repeat every 4 powers.

The closest multiple of 4 to 22 is 20.

Therefore the last digit of 2^{22} is $4 = \text{B}$.

18. D If the dinner costs d and R40 tip is given, the total cost of the meal is $d + 40$.
 Since there are four people eating, each of their share will be $(d + 40) \div 4$.

19. B $\left(1 + \frac{1}{2}\right) \times \left(1 + \frac{1}{3}\right) \times \left(1 + \frac{1}{4}\right) \times \dots \times \left(1 + \frac{1}{n}\right)$
 $\left(\frac{\cancel{2}}{2}\right) \times \left(\frac{\cancel{3}}{\cancel{2}}\right) \times \left(\frac{\cancel{4}}{\cancel{3}}\right) \times \dots \times \left(\frac{n+1}{\cancel{n}}\right) = \frac{n+1}{2}$

$\therefore \frac{n+1}{2}$ will be a whole number when n is odd.

20. A All shorter edges are equal in length and so the figure can be divided into 33 small squares as shown alongside.

Each of these squares would then have an area of $\frac{297}{33} = 9 \text{ cm}^2$.

Each square would then have a side length of $\sqrt{9} = 3 \text{ cm}$.

The diagram has 36 sides, giving a perimeter of $36 \times 3 = 108 \text{ cm}$.

