



MAGIC SQUARES

A Magic Square is a square with a special arrangement of numbers such that the numbers in each row, each column and the diagonals adds up to the same number.

For example:

A 3 × 3 Magic Square of numbers 1 to 9, can be arranged as following.

2	7	6	→ 15
9	5	1	→ 15
4	3	8	→ 15
↙ 15	↓ 15	↓ 15	↓ 15

Now, look at the arrangement of the numbers carefully.

If you arrange the given numbers in an ascending order, you get

1, 2, 3, 4, 5, 6, 7, 8, 9 where 5 is the number that lies exactly in the middle.

In the above magic square notice that 5 is right in the middle of the square.

Let us now look at the diagonals 2,5,8

$$5 - 2 = 3; 8 - 5 = 3$$

Similarly, the other diagonal: 6,5,4

$$6 - 5 = 1; 5 - 4 = 1$$

And, the second row

$$9 - 5 = 4; 5 - 1 = 4$$

Do you see a pattern?

Also, the sum in each case is 15, which is called the **Magic Constant**. And in this case it is  $5 \times 3 = 15$

**But why is it called a Magic Square?**

It seems that since ancient times, squares have been connected to the supernatural and the magical world.

3.1 Complete the Magic Square, using numbers from 7 to 21, given that the Magic Constant =  $14 \times 3 = 42$ .

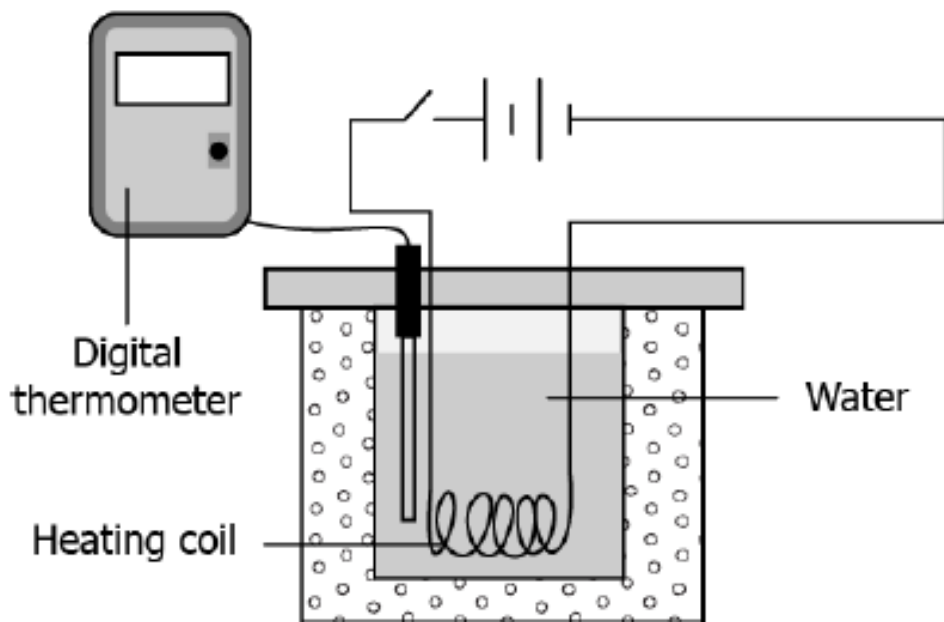
10	?	?
?	14	?
11	?	18

3.2 The magic square, given below uses all integers from 7 to 15. The sum of the numbers in each row, column and the two main diagonals are the same. Which number would replace \* in the given square, once completed?

*		
		7
		14

Q 3.3:

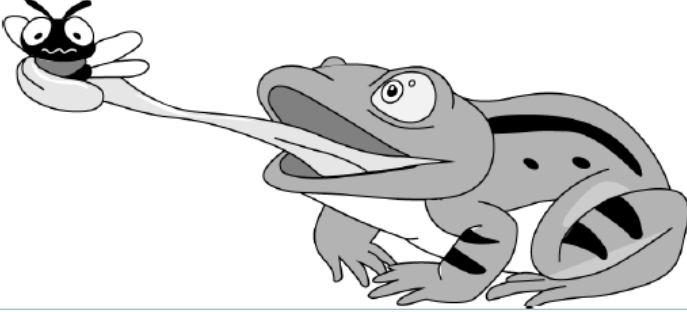
A student performs an experiment where he uses a heating coil to heat the water as shown in the image. The initial temperature of the water is measured as 10°C. After switching it on for 5 min, the student records the temperature of the water as 18°C. The water is allowed to return back to its initial temperature. The activity is then repeated with another heating coil having half the length of the original heating coil. He notices that after 5 min the temperature of the water reads 14°C. Which statement can be concluded based on the activity?



- (a) Reading on thermometer reduces with time
- (b) Temperature of water drops with every repetition
- (c) Length of the material affects the amount of heating
- (d) Temperature of the water increases after a certain period of time

### Q3.4

The image shows a frog acquiring its food with the help of his tongue. A student observed the image and claimed that the frog takes its food by sucking. Is the claim made by the student, correct?



- (a) No; the frog is eating food as a whole, so its mode of feeding is swallowing.
- (b) No; the frog is using teeth to break its food, so its mode of feeding is chewing.
- (c) Yes; the frog is pulling in the insect as is done for liquids, so its mode of feeding is sucking.
- (d) Yes; the frog is using its body to grind up the insect, so its mode of feeding is sucking.

### Q 3.5:

बढ़ती जनसंख्या ने अनेक प्रकार की समस्याओं को जन्म दिया है- रोटी, कपड़ा, मकान की कमी, बेरोजगारी, निरक्षता, कृषि एवं उद्योगों के उत्पादनों में कमी आदि। हम जितना अधिक उन्नति करते हैं या विकास करते हैं जनसंख्या उनके अनुपात में कहीं अधिक बढ़ जाती है। बढ़ती जनसंख्या के समक्ष सभी सरकारी प्रयास असफल दिखाई देते हैं। कृषि उत्पादन और औद्योगिक विकास बढ़ती जनसंख्या के सामने नगण्य सिद्ध हो रहे हैं। इन सभी बातों को ध्यान में रखते हुए जनसंख्या वृद्धि पर नियंत्रण की अति आवश्यकता है। इसके बिना विकास के लिए किए गए सभी प्रकार के प्रयत्न अधूरे रह जाएँगे।

प्रश्न -१ विकास कार्य क्यों नहीं दिखाई देते ?

- (i) राजनीतिक अक्षमता के कारण
- (ii) समस्याओं के कारण
- (iii) भ्रष्टाचार के कारण

(iv) जनसंख्या की वृद्धि के कारण

प्रश्न -2 बढ़ती जनसंख्या ने इनमें से किस समस्या को जन्म नहीं दिया है?

(i) रोटी कपड़े की समस्या

(ii) बेरोजगारी की समस्या

(iii) निरक्षरता की समस्या

(iv) दहेज की समस्या

प्रश्न -3 नगण्य" शब्द का सही अर्थ है

(i) अपर्याप्त

(ii) थोड़ा

(iii) पर्याप्त

(iv) बहुत

प्रश्न-4 निरक्षरता शब्द का विलोम शब्द है-

(i) अक्षरता

(ii) साक्षरता

(iii) क्षरता

(iv) दुरक्षरता