



Note: The answers are written in blue!

Introduction:

1. The thing or action being repeated in a series/list is called a pattern.
2. The piece that repeats over and over in a design is called a 'MOTIF'
3. The pattern that are made up of repeating shapes and cover an area completely without leaving any gaps or overlapping is called a tessellation
4. Anything that is repeated again and again is called to be in a Loop

Questions:

Solve the following questions based on above mentioned points:

1. Match the following. Write down the matched pair in answer column and explain the reason why they matched in reason column.

Column A	Column B
1) 2,4,6,8	A) Frog, Goat, Horse
2) Cat, Dog, Elephant	B) Lioness, Peahen, Tigress
3) Lion, Peacock, Tiger	C) 10,12,14,16
4) 3,4,5	D) Triangle, Square, Pentagon

Answer	Reason
1-C	The pair forms a series of first eight multiples of 2
2-A	The pair forms a series of animal names in alphabetical order
3-B	The pair matches the male counterpart of animal in column A to their female counterpart in column B
4-D	The numbers 3,4,5 in column A corresponds to the number of sides in shapes mentioned in column B

2. Complete the following series and identify and write down the pattern in the series
 - a. **Series:** Violet, Indigo, Blue, **Green, Yellow, Orange, Red**
Pattern: Order of colors of rainbow (VIBGYOR)
 - b. **Series:** 1,2,4,8,16,**32,64,128**
Pattern: The series is incremented by adding the number itself i.e. the first number is 1. If 1 is added to itself we get 2. Then if 2 is added to itself we get 4 and if 4 is added to itself we get 8!
 - c. **Series:** Five, Ten, **Fifteen**, Twenty, **Twenty Five**, Thirty, **Thirty Five**, Forty
Pattern: Series is multiple of five written in words
 - d. **Series :** A,D,G,J,M,**P,S,V**



Pattern: It is a series of alphabets written by dropping 2 alphabets after each of the alphabet in the series. So it starts with 'A' and then we drop next to alphabets ie 'B' and 'C' and we get the next value ie 'D' then again we drop 2 alphabets after 'D' ie 'E' and 'F' and we write 'G' and so on!

3. Identify the odd man out in the below series and also give reason for choosing the answer :

a. Kitten, Calf, Pup, Duck

Answer: Duck

Reason: Kitten, Calf and Pup are the young ones of Cat, Cow and Dog. The young one of Duck is Duckling!

Also, Duck is a bird and others are animals

b. Tomato, Strawberry, Raspberries, Peas, Orange

Answer: Peas

Reason: If we read the alphabet in reverse from T, the letters will be T, S, R, Q, P, O. The starting letter of each word in series is in this sequence except 'Peas'. We missed a word that would start with 'Q'.

Also, only peas is a vegetable all others are fruits. Yes, Tomato is also a fruit!

c. Triangle, Heptagon, Octagon, Pentagon

Answer: Octagon

Reason: All the figures in the given series have odd number of sides ie triangle has 3 sides, Heptagon has 7 sides and Pentagon has 5 sides. But Octagon has even number of sides ie 8

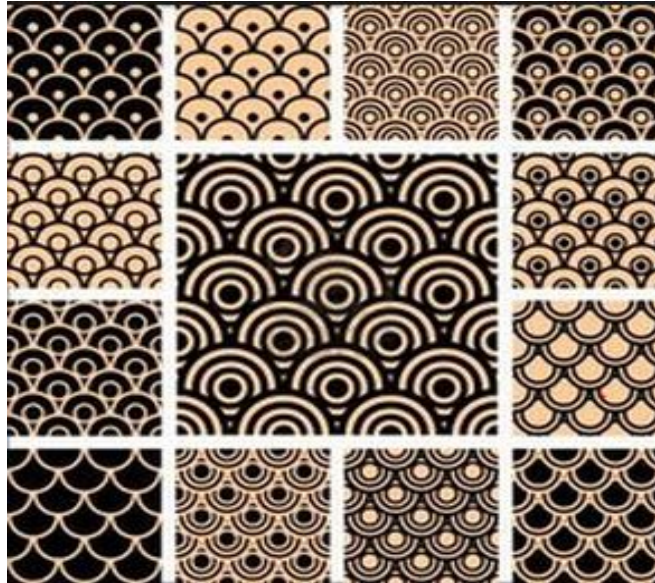
d. January, October, April, August

Answer: April

Reason: All the months in given series have 31 days except for April

4. Encircle a Motif/s in below design:

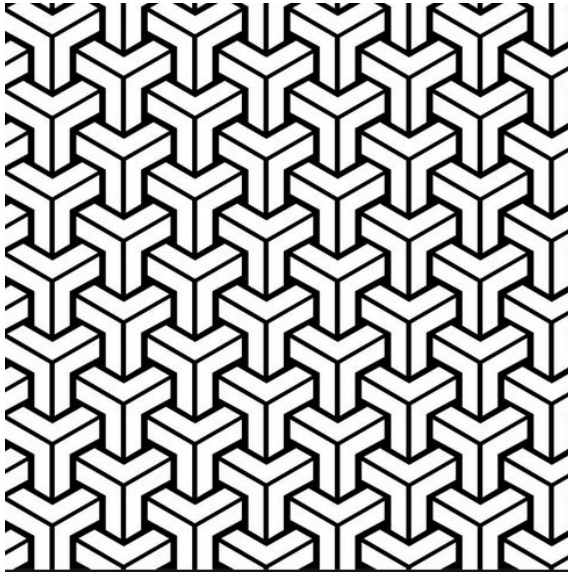
a.



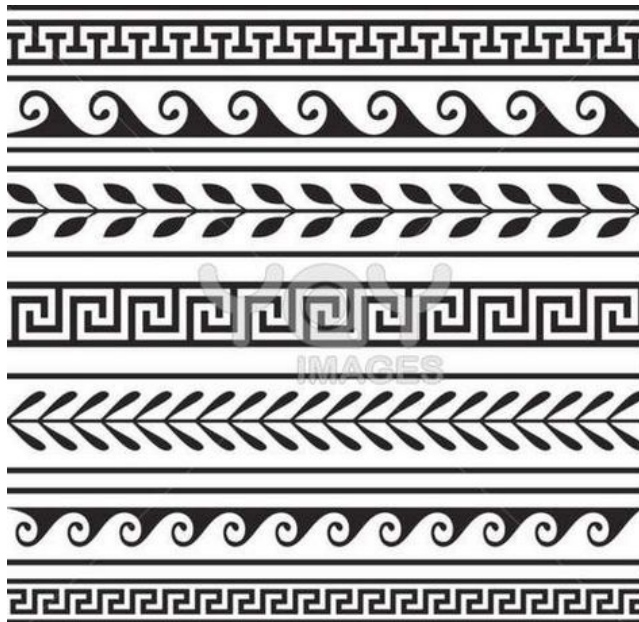
b.







c.



d.



5. Answer whether the following things tessellate or not.

Object	Image	Yes/No
Bee Hive		Yes
Pineapple		Yes
Football		Yes
Raspberry		Yes

6. Identify which of the following objects/situations are in loop and also explain why?

- Hands of a clock – Yes they keep moving on and on in loop from 12 am to 12 pm
- Rotating merry go round – Yes it keeps moving on and on in a circle
- A Coin – No. Just because an object is circular in shape it isn't in loop. There is no action or thing here that is repeated again and again
- A fan which is switched on – Yes. It keeps moving again and again in circular motion till the time it is switched off
- A round trip train between Chennai-Mumbai-Chennai – Yes. It is in loop. The train keeps moving again and again between Chennai and Mumbai



- f. A cello tape – Yes. The tape is rolled over and over in a loop on a cardboard. So just because its circular but it isn't moving it doesn't mean it is not in loop.
- g. Wheel of a moving car – Yes. As the car is moving the wheel keeps on moving round and round in a loop.
- h. The Earth – Yes. The rotation and revolution of Earth are in loop.

- 7. Draw a tessellation with a single shape.
- 8. Draw a tessellation which is made up of multiple shapes.
- 9. What is difference between a loop and a pattern?

A pattern that is continually repeated again and again **until a condition is met** is called a **loop**. For example: A fan moves again and again in circular motion till the time condition that the fan is on is met. The moment we change the condition that fan is switched off, the fan stops being in a loop and there is a simple pattern in which blades of fan are arranged.

- 10. Identify a pattern on a chess board? Is it a tessellation? Explain.

The chess board has a pattern of alternative black and white rectangle. Yes, it is a tessellation because the pattern is repetitive and there is no gap in the pattern nor the shapes of pattern are overlapping.

- 11. Write down the following series:

- i. A series of 5 numbers in which the difference between consecutive numbers is 2 and starts with number 10

There are 2 possibilities here:

Series 1: 10, 12, 14, 16, 18

Series 2: 10, 8, 6, 4, 2

- ii. A series of 7 multiples of 10 which starts with number 50

50, 60, 70, 80, 90, 100, 110

Decrementing series is not possible because there aren't 7 multiples of 10 below 50!

- iii. A series of odd months of the year

January, March, May, July, September, November

- iv. A series first five composite numbers

4, 6, 8, 9, 10

Explanation: 0 and 1 are neither prime nor composite. 2, 3, 5, 7 are all prime.