

5.1 Revision

Marks Available : 100

**Question 1**

List the elements of the following sets;

(i)  $Q = \{\text{The factors of 18}\}$

$$Q = \{ \quad , \quad , \quad , \quad , \quad , \quad \}$$

(ii)  $R = \{\text{The factors of 12}\}$

$$R = \{ \quad , \quad , \quad , \quad , \quad , \quad \}$$

(iii)  $Q \cap R$

$$Q \cap R = \{ \quad , \quad , \quad , \quad \}$$

[ 6 marks ]

**Question 2**

Explain each of the following symbols;

(i)  $\emptyset$

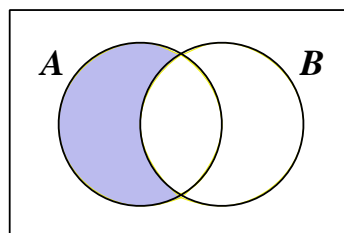
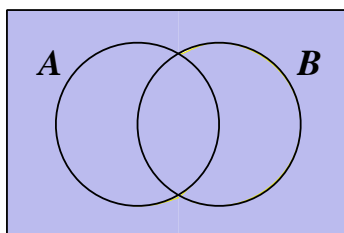
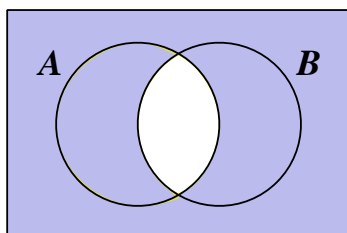
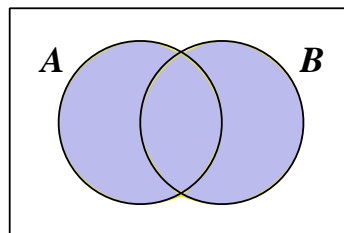
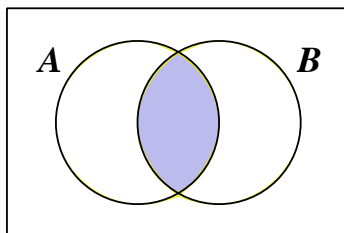
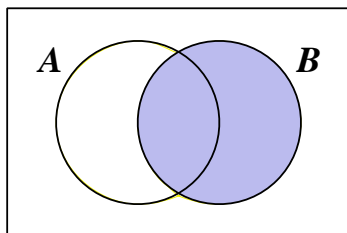
(ii)  $\notin$

(iii)  $\cup$

[ 6 marks ]

**Question 3**

For each Venn Diagrams use set notation to describe the shading.



[ 12 marks ]

**Question 4**

Let  $S = \{\text{The first six multiples of 6}\}$

$F = \{\text{Factors of 36}\}$

$T = \{\text{The first eight triangular numbers}\}$

(i) List the elements of set  $S$

$$S = \{ \quad, \quad, \quad, \quad, \quad, \quad \}$$

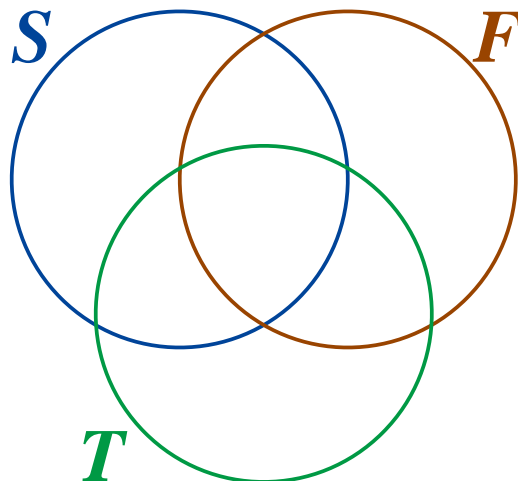
(ii) List the elements of set  $F$

$$F = \{ \quad, \quad, \quad, \quad, \quad, \quad, \quad, \quad, \quad \}$$

(iii) List the elements of set  $T$

$$T = \{ \quad, \quad, \quad, \quad, \quad, \quad, \quad, \quad \}$$

(iv) Complete the Venn diagram to show the relationship between  $S$ ,  $F$  and  $T$



List all elements, if any, that are in the following intersections.

(v)  $S \cap F = \{ \quad, \quad, \quad, \quad \}$

(vi)  $S \cap F \cap T = \{ \quad, \quad \}$

(vii)  $S \cap F \cap T' = \{ \quad, \quad \}$

(viii)  $F \cap T' \cap S' = \{ \quad, \quad, \quad \}$

(ix) What is  $n(S \cup F)$ ?  $\quad$

[ 18 marks ]

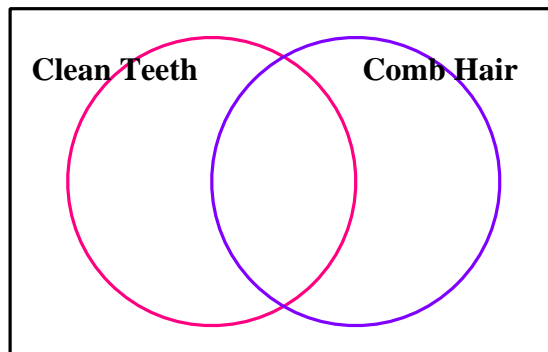
**Question 5**

A group of 45 teenagers were asked if they cleaned their teeth that morning. They were also asked if they combed their hair.

Here is a summary of their answers :

- ◇ 38 said they cleaned their teeth.
- ◇ 29 said they combed their hair.
- ◇ 23 said they had had both cleaned their teeth and combed their hair.

( i ) Complete the Venn Diagram to clarify the teenagers' replies :



( ii ) How many teenagers neither cleaned their teeth nor combed their hair ?

[ 6 marks ]

**Question 6**

In a class of children,  $G$  is the set of girls and  $F$  is the set of those who like football.

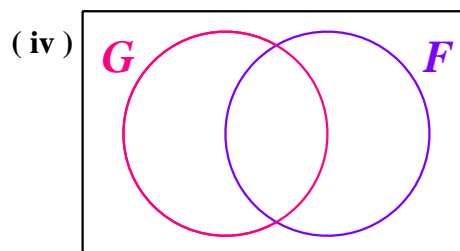
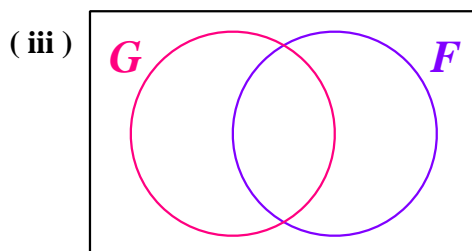
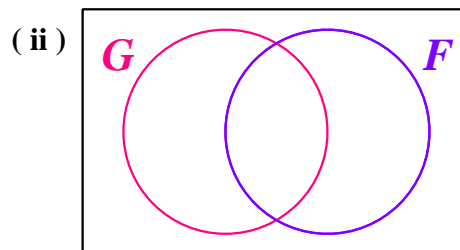
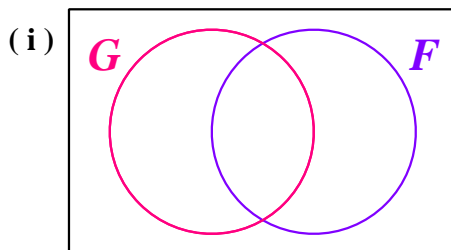
Shade the part that represents:

On ( i ) girls who like football.

On ( ii ) girls who dislike football.

On ( iii ) boys who like football.

On ( iv ) boys who do not like football.



[ 8 marks ]

**Question 7**

Set  $M = \{\text{Names of seasons in a year}\}$

What is  $n\{\text{Names of seasons in a year}\}$  ?

[ 2 marks ]

**Question 8**

TRUE or FALSE ?

- ( i )  $n\{\text{factors } 21\} = 4$
- ( ii )  $n\{\text{factors of } 17\} = 2$
- ( iii )  $n\{\text{factors of an even number}\} = 3$
- ( iv )  $n\{\text{factors of square number}\} = 3$
- ( v )  $n\{\text{common factors of } 15 \text{ and } 24\} = 3$

[ 10 marks ]

**Question 9**

In this question,

$L = \{\text{Objects made from the metal lead}\}$

$B = \{\text{Types of balloon}\}$

- ( i ) Describe the set  $L \cap B$  in words.
  
  
  
  
  
  
  
  
  
  
- ( ii ) If  $L \cap B = \emptyset$ , describe what this means.

[ 4 marks ]

**Question 10**

In this question, consider all the positive integers.

Within this consideration,  $P = \{\text{Prime numbers}\}$

$C = \{\text{Composite numbers}\}$

Describe in words the set  $P \cup C$

[ 2 marks ]

**Question 11**

Let :  $A$  be the set of numbers in the infinite sequence 4, 8, 12, 16, 20, ...

$B$  be the set of numbers in the infinite sequence 2, 6, 10, 14, 18, ...

( i ) List the a few members of the set  $A \cup B$

( ii ) What is the special name given to the set  $A \cup B$  ?

( iii ) Describe  $A \cap B$

[ 6 marks ]

**Question 12**

In a class of 30 pupils,

◇ 18 say they like pancakes.

◇ 13 say they like maple syrup.

◇ 6 say they do not like either pancakes nor maple syrup.

( i ) Draw a Venn Diagram to clarify what the pupils say.

( ii ) How many of the pupils like both pancakes and maple syrup ?

[ 6 marks ]

### Question 13

Let  $S = \{\text{Square numbers}\}$   
 $F = \{1, 4, 16, 64, 256, 1024\}$

(a) (i) List some elements of set  $S$

(ii) Describe set  $F$  in words

(b) For each of the following, decide if the given statement is TRUE or FALSE.

(i)  $25 \in S$

(vi)  $S \cup F = S$

(ii)  $1024 \notin S$

(vii)  $\pi \in S'$

(iii)  $64 \in S \cap F$

(viii)  $F \cap \{\text{Prime numbers}\} = \emptyset$

(iv)  $n(F) = 8$

(ix)  $36 \in S \cap F'$

(v)  $n(S \cap F) = 6$

(x)  $3 \notin S \cup F$

[ 14 marks ]