6.1 The Three Hoop Venn Diagram
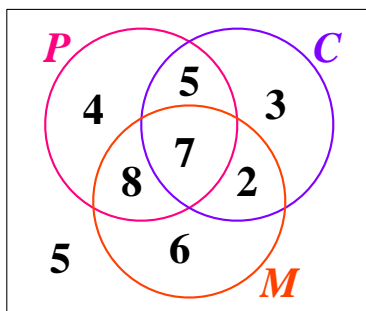The number of sixth form students who study Physics or Chemistry or Maths
at a small sixth form college is;
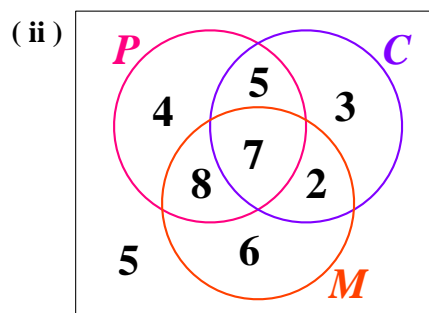

Where • *P* is the hoop containing Physicists
       • *C* is the hoop containing Chemists
and   • *M* is the hoop containing Mathematicians

Before watching the teaching video have a go at the following question;
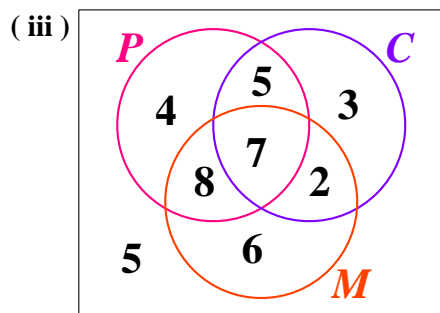
In each of the following Venn Diagram, shade in the region specified and hence
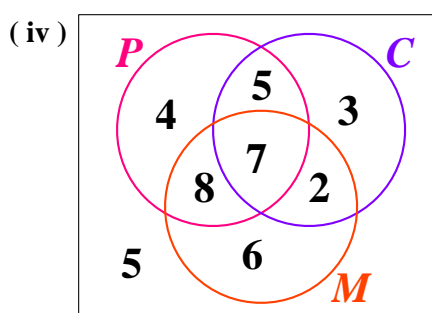give the total number of sixth form students in that region.

(i)

$n(M) =$

(ii)

$n(P \cap C) =$

(iii)

$n(P \cap C \cap M') =$

(iv)
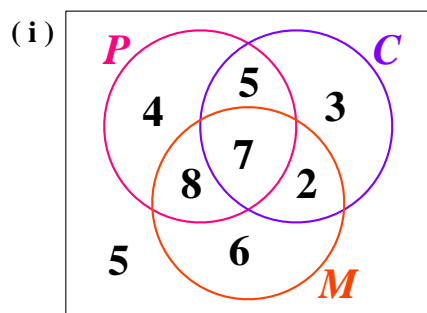
$n(C \cap M)' =$

[8 marks]

Teaching Video :

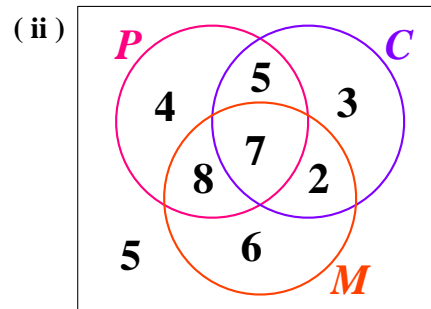### 6.2 Exercise

Marks Available : 35

Question 1

This continues the example featured at the start of the lesson and in the teaching video with a further set of four questions about the college students.
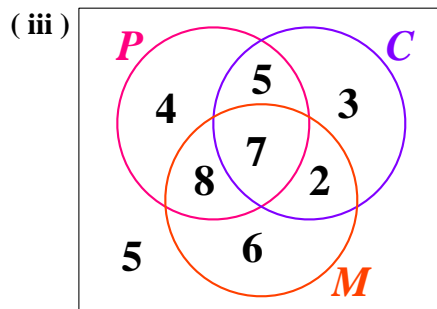
In each of the following Venn Diagram, shade in the region specified and hence give the total number of sixth form students in that region.
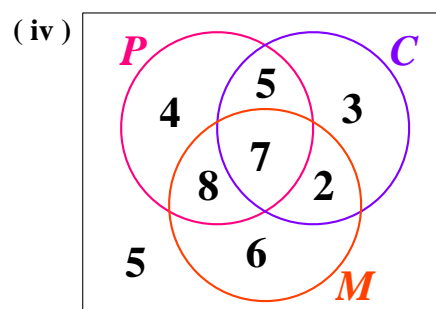
(i)

$n(C) =$

(ii)

$n(P \cap M) =$
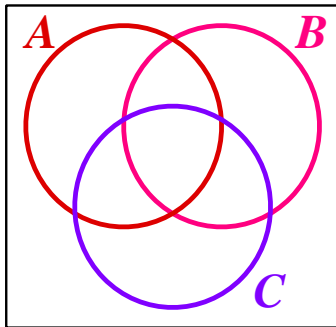
(iii)

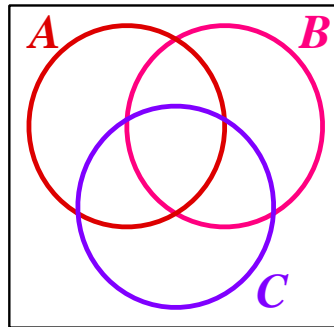$n(P \cap M \cap C') =$

(iv)
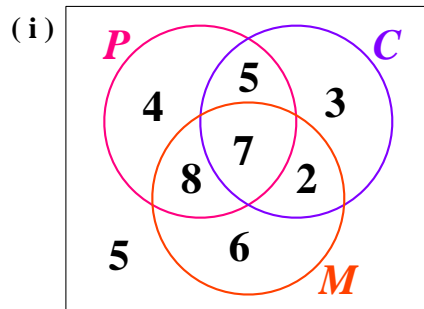
$n(P \cap M)' =$

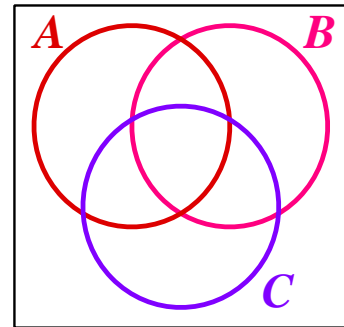[8 marks]

Question 2

On the Venn Diagrams below, shade the region specified;

Shade : A

Shade : A ∩ B

Shade : A ∩ B ∩ C
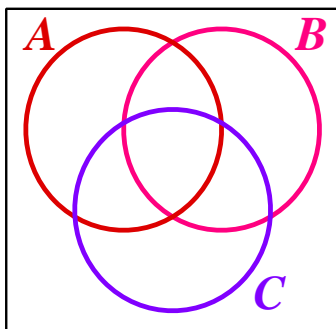
Shade :B
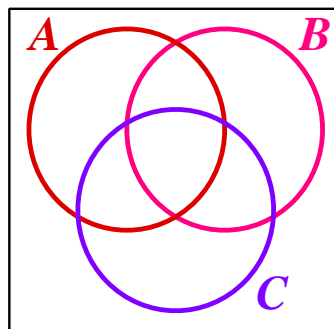
Shade : B ∩ C
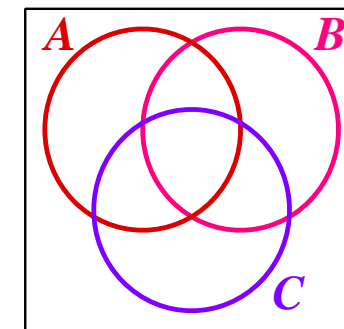
Shade : B ∩ C ∩ A′
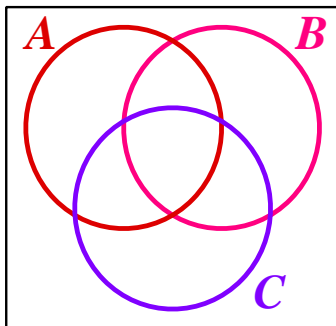
Shade : A ∩ C
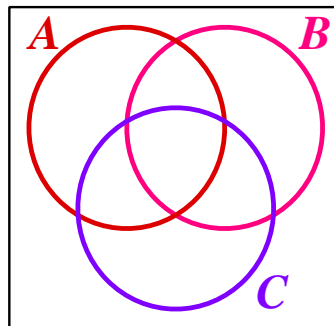
Shade : A ∩ C ∩ B
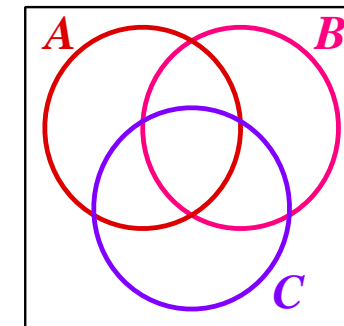
Shade : (A ∩ C ∩ B)′
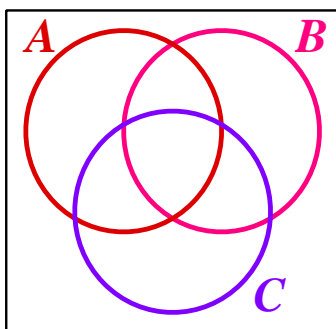
Shade : C′
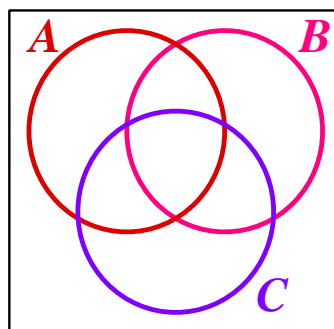
Shade : C′ ∩ B
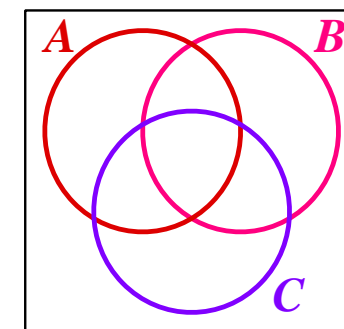
Shade : C′ ∩ B ∩ A′

[**12 marks**]

Question 3

Let *T*, *M* and *F* be the following sets;

T = { The first five triangular numbers }
M = { The first five multiples of 3 }
F = { The factors of 15 }

(a) List the elements of sets *T*, *M* and *F* below,

(i) T = { _____ , _____ , _____ , _____ , _____ }

[**1 mark**]

(ii) M = { _____ , _____ , _____ , _____ , _____ }

[**1 mark**]

(iii) F = { _____ , _____ , _____ , _____ }

[**1 mark**]

(b) **S**how the relationship between *T*, *M* and *F* on a Venn Diagram
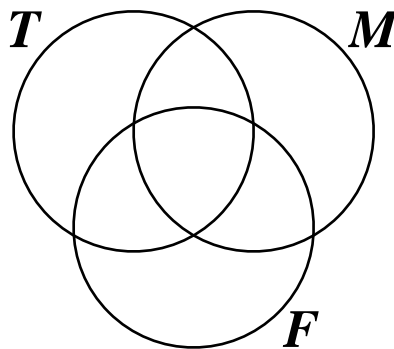
[**5 marks**]

(c) List the elements of the following,

(i) $T \cap M$ = { _____ , _____ , _____ }

[**1 mark**]

(ii) $T \cap F$ = { _____ , _____ , _____ }

[**1 mark**]

(iii) $M \cap F$ = { _____ , _____ }

[**1 mark**]

(iv) $T \cap M \cap F$ = { _____ , _____ }

[**1 mark**]

(v) $T \cap M \cap F\,' $ = { _____ }

[**1 mark**]

(vi) $T \cap M\,' \cap F$ = { _____ }

[**1 mark**]

(vii) What does the statement $T\,' \cap M \cap F = \varnothing$ tell you ?

[**1 mark**]