MATHEMATIC A

TOPIC- Set Language and notation

6 $S = \{c, h, i, n, a\}$ $V = \{i, t, a, l, y\}$

List the elements of the set

(i) $S \cap V$

(ii) $S \cup V$

(Total for Question 6 is 2 marks)

7 $\mathscr{E} = \{1,$
$A = \{1, 2, 3, 4, 5, 6\}$
$B = \{\text{odd numbers}\}$

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

(1)

C is a set such that $A \cap C = \{4, 5\}$
The set C has 4 members.

(b) List the members of one possible set C

(2)

(Total for Question 7 is 3 marks)

15 (a) $A = \{p, r, a, g, u, e\}$

$B = \{p, a, r, i, s\}$

$C = \{b, u, d, a, p, e, s, t\}$

List the members of the set

(i) $A \cap B$

.....

(ii) $B \cup C$

.....

(2)

(b) $D = \{r, o, m, e\}$

$E = \{l, i, s, b, o, n\}$

$F = \{b, e, r, l, i, n\}$

Put one of the letters D, E or F in the box below to make the statement correct.

$$A \cap \square = \varnothing$$

Explain your answer.

.....

(1)

(Total for Question 15 is 3 marks)

1 $\mathscr{E} = \{2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
$A = \{\text{odd numbers}\}$
$P = \{\text{prime numbers}\}$

List the members of the set

(i) $A \cap P$,

.....

(ii) $A \cup P$.

.....

(Total for Question 1 is 2 marks)

13 $\mathscr{E}$ = {even numbers}
A = {factors of 8}
B = {factors of 20}

List the members of $A \cap B$

.....

(Total for Question 13 is 2 marks)

14 $\mathscr{E}$ = {positive whole numbers **less than** 13}
A = {even numbers}
B = {multiples of 3}
C = {prime numbers}

(a) List the members of the set

(i) $A \cap B$

.....

(ii) $B \cup C$

.....

(2)

(b) Is it true that $14 \in A$?

Tick (✓) the appropriate box.

Yes	No
☐	☐

Explain your answer.

.....

(1)

(Total for Question 14 is 3 marks)

7 $\mathscr{E}$ = {even numbers}
$A = \{2, 4, 6, 8, 10\}$

(a) B is a set such that $A \cap B = \{4, 8\}$
The set B has 3 members.

List the members of one possible set B.

.....

(2)

(b) C is a set such that $A \cap C = \varnothing$
The set C has 3 members.

List the members of one possible set C.

.....

(1)

(Total for Question 7 is 3 marks)

9 $\mathscr{E}$ = {whole numbers}
A = {factors of 100}
B = {multiples of 5}
List the members of the set $A \cap B$

(Total for Question 9 is 2 marks)

1 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$
$A = \{1, 3, 5, 7\}$
$B = \{2, 4, 6, 8\}$

(a) Explain why $A \cap B = \varnothing$

.....

.....

(1)

$x \in \mathscr{E}$ and $x \notin A \cup B$

(b) Write down the value of x.

$x =$ .....

(1)

$A \cap C = \{3, 7\}$, $B \cap C = \{8\}$ and $A \cup B \cup C = \mathscr{E}$

(c) List all the members of C.

.....

(2)

(Total for Question 1 is 4 marks)

4 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{even numbers}\}$

$B = \{\text{multiples of } 3\}$

(a) List the members of set B.

.....

(1)

(b) Find $A \cup B$

.....

(1)

(c) Find $A \cap B$

.....

(1)

x is a member of $\mathscr{E}$

$x \in B$

$x \notin A$

(d) What are the possible values of x?

.....

(2)

(Total for Question 4 is 5 marks)

10 $A = \{2, 4, 6, 8, 10, 12, 14\}$
$B = \{1, 3, 5, 7, 9, 11, 13\}$
$C = \{3, 6, 9, 12\}$

(a) List the members of the set

(i) $A \cap C$

.....

(ii) $A \cup C$

.....

(2)

(b) Explain why $A \cap B = \varnothing$

.....

(1)

(Total for Question 10 is 3 marks)

2 $\mathscr{E} = \{4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$

$A = \{\text{multiples of } 5\}$

$B = \{\text{odd numbers}\}$

(a) List the members of the set

(i) $A \cap B$

(ii) $A \cup B$

(2)

The set C has 6 members and $B \cap C = \varnothing$

(b) List the members of set C.

(2)

(Total for Question 2 is 4 marks)

3 (a) Work out the value of $\dfrac{17.7 \times 5.8}{\sqrt{3.4} + 5.3}$

Write down all the figures on your calculator display.

(2)

(b) Give your answer to part (a) correct to 3 significant figures.

(1)

(Total for Question 3 is 3 marks)

Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 $P = \{p, o, r, t, u, g, a, l\}$
$I = \{i, t, a, l, y\}$

(a) List the members of the set

(i) $P \cap I$

.....

(ii) $P \cup I$

.....

(2)

$F = \{f, r, a, n, c, e\}$

(b) Is it true that $I \cap F = \varnothing$?

Tick (✓) the appropriate box.

Yes	No
☐	☐

Explain your answer.

.....

(1)

(Total for Question 1 is 3 marks)

3 $\mathscr{E}$ = {positive whole numbers less than 19}
A = {odd numbers}
B = {multiples of 5}
C = {multiples of 4}

(a) List the members of the set

(i) $A \cap B$

.....

(ii) $B \cup C$

.....

(2)

D = {prime numbers}

(b) Is it true that $B \cap D = \varnothing$?

Tick (✓) the appropriate box.

Yes	No
☐	☐

Explain your answer.

.....

(1)

(Total for Question 3 is 3 marks)

10 (a) $A = \{s, u, p, e, r\}$
$B = \{c, o, m, p, u, t, e, r\}$

List the members of the set

(i) $A \cap B$

(ii) $A \cup B$

(2)

(b) $X = \{\text{prime numbers}\}$
$Y = \{\text{factors of } 12\}$

Is it true that $X \cap Y = \varnothing$?

Tick (✓) the appropriate box.

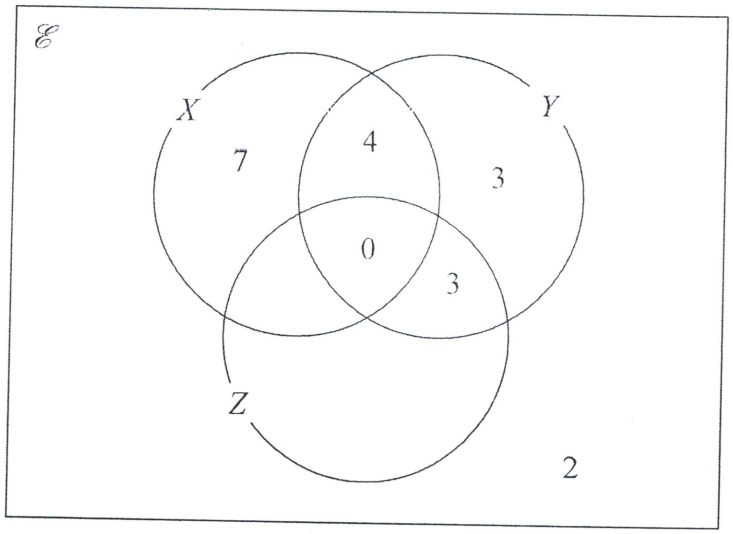
Yes	No
☐	☐

Explain your answer.

(1)

(Total for Question 10 is 3 marks)

12 The Venn diagram shows a universal set $\mathscr{E}$ and three sets X, Y and Z.



The numbers shown represent **numbers** of elements.

$n(X') = 14$
$n(Z) = 14$

(a) Complete the Venn diagram.

(2)

(b) Find the value of

(i) $n(X \cup Z)$

.....

(ii) $n(X \cap Y')$

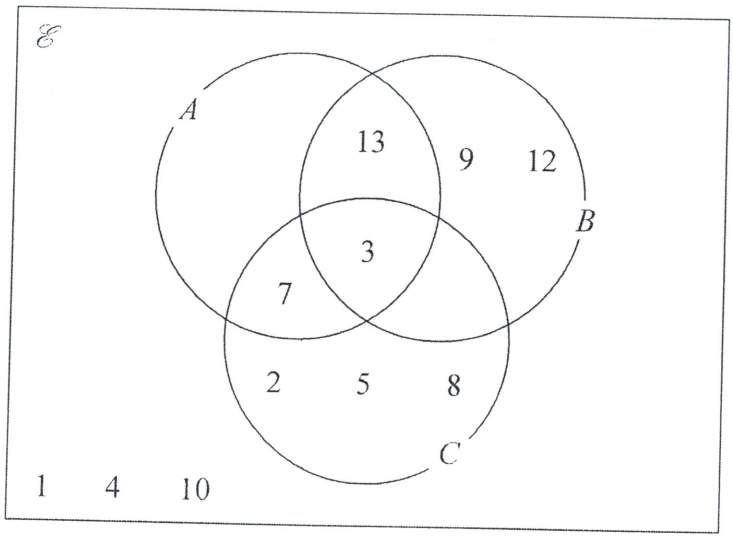
.....

(2)

(Total for Question 12 is 4 marks)

8 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$
$A = \{3, 7, 11, 13\}$
$B = \{3, 6, 9, 12, 13\}$
$C = \{2, 3, 5, 6, 7, 8\}$

(a) Complete the Venn diagram.



(1)

(b) List the members of the set $B' \cap C$

.....

(1)

(c) List the members of the set $(A \cup C)' \cap B$

.....

(1)

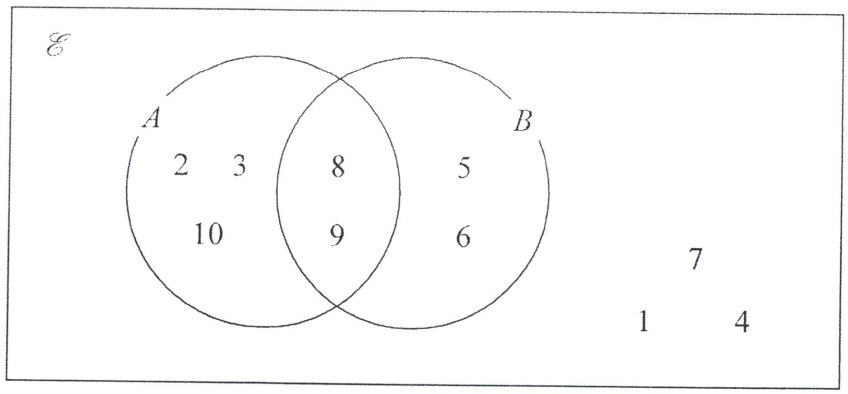
(d) Find $n(A' \cap B')$

.....

(1)

(Total for Question 8 is 4 marks)

2



The Venn diagram shows all of the elements in sets A, B and $\mathscr{E}$.

(a) Write down the elements in A'

.....

(1)

(b) Find $n(A \cap B)'$

.....

(1)

(c) Find the elements in $(A \cap B) \cup (A \cup B)'$

.....

(1)

$A \cap C = \emptyset$
$B \cup C = \{5, 6, 7, 8, 9\}$
$n(C) = 3$

(d) Write down the elements in C.

.....

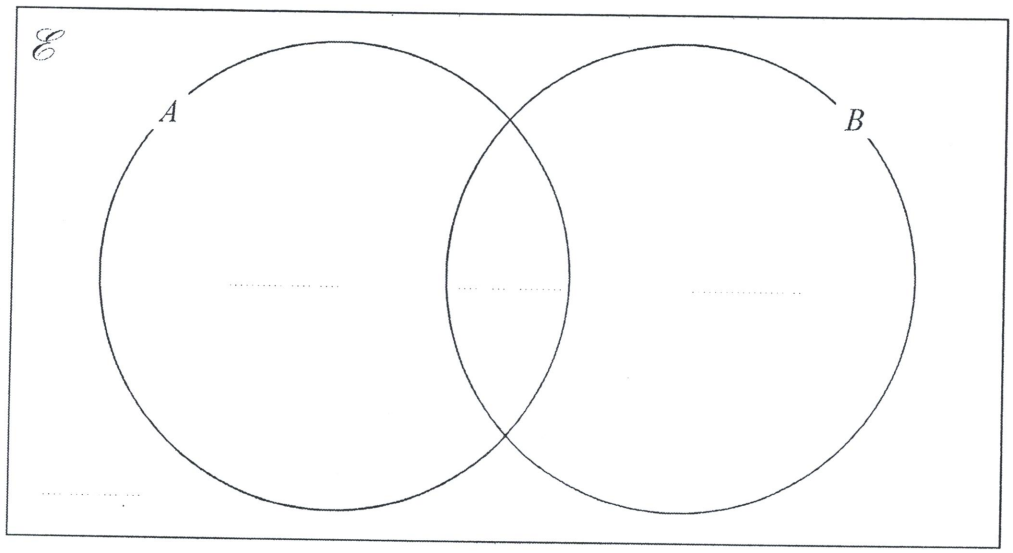
(1)

(Total for Question 2 is 4 marks)

5 A and B are two sets.

$$n(\mathscr{E}) = 36$$
$$n(B) = 21$$
$$n(A \cap B) = 8$$
$$n(A') = 18$$

(a) Complete the Venn diagram to show the **number of elements** in each region of the Venn diagram.



(3)

(b) Find $n(A \cup B)$

.....

(1)

(c) Find $n(A \cap B')$

.....

(1)

(Total for Question 5 is 5 marks)

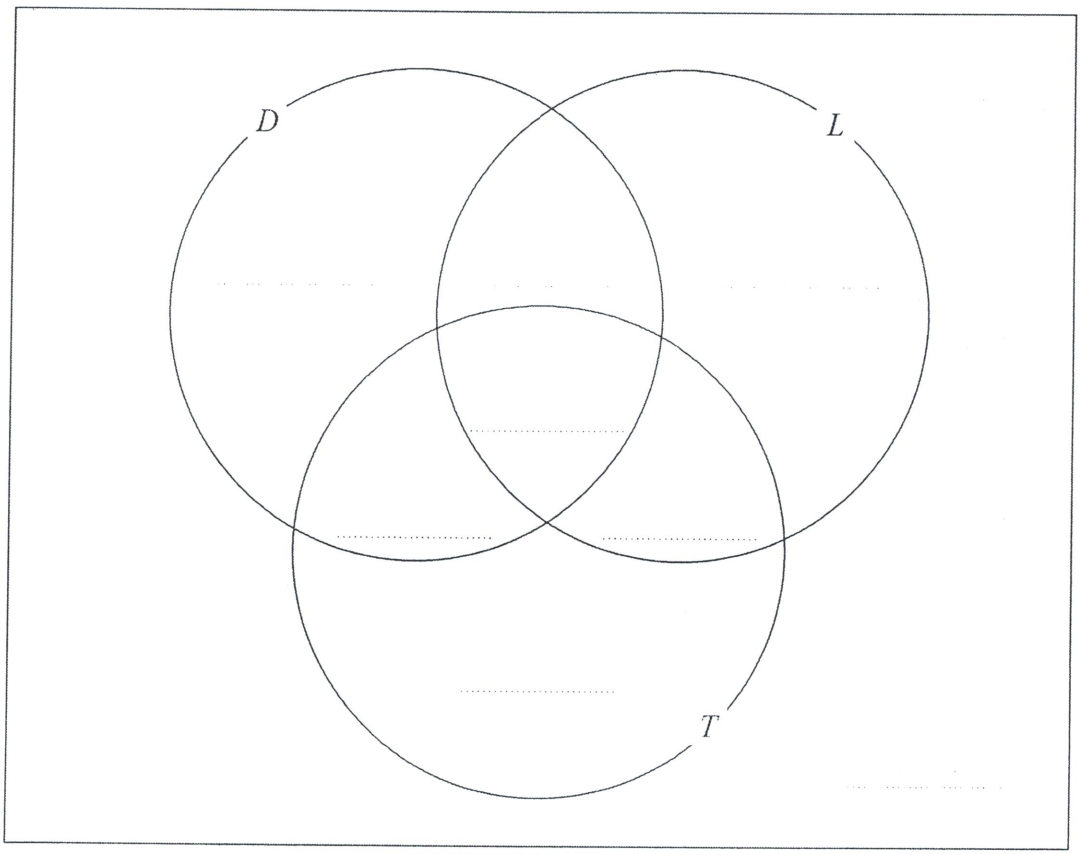
11 Each student in a group of 32 students was asked the following question.

"Do you have a desktop computer (D), a laptop (L) or a tablet (T)?"

Their answers showed that

19 students have a desktop computer
17 students have a laptop
16 students have a tablet
9 students have both a desktop computer and a laptop
11 students have both a desktop computer and a tablet
7 students have both a laptop and a tablet
5 students have all three.

(a) Using this information, complete the Venn diagram to show the number of students in each appropriate subset.



(3)

One of the students with both a desktop computer and a laptop is chosen at random.

(b) Find the probability that this student also has a tablet.

.....

(1)

(Total for Question 11 is 4 marks)