**Mathematics**                    **Writing Time   :   2 Hours**
                                   **Total Marks    :   100**

### READ THE FOLLOWING DIRECTIONS CAREFULLY:

**1.** Do **not** write for the first **fifteen minutes.**  This time is to be spent reading the questions.  After having read the questions you will be given **two** hours to answer all questions.

**2.** In this **question paper**, you will find 25 questions in Section A and 5 questions in Section B.  You must answer **all** the questions.  Each question in Section A is worth **2 marks**.

**3.** All answers for Section 'A' and 'B' **must** be written in the answer sheets provided by the school.

**4.** Once the examination begins, you will not be allowed to ask questions, speak with others or move around.

**5.** If you finish before the time is over, close the Answer Booklet, and sit quietly.

> DO NOT forget to write your name, class/section and the name
> of your school on the answer sheet(s).

## IF YOU HAVE ANY QUESTIONS, ASK THEM NOW!

## TURN PAGE

**(15 Minutes is to be allowed for reading as well as for teachers on duty to explain the instructions)**

**SECTION A**
**25 Questions [50 marks]**
**Answer ALL questions**

*Direction: Each question in this section is followed by four possible choices of answers. Choose the correct answer and write it down in the answer sheet provided by the school.*

1.  Which one of the following symbols represents an empty set and a proper subset respectively?
    **A**  $\phi$ and $\cap$
    **B**  $\in$ and $\subset$
    **C**  $\cup$ and $\subset$
    **D**  $\phi$ and $\subset$

2.  Which one of the following sets does not have a cardinal number?
    **A**  $\{y : y > 0\}$
    **B**  $\{w : 1 \le w \le 10\}$
    **C**  $\{x : 0 < x < 100\}$
    **D**  $\{a : a$ is whole number between 10 and 20$\}$

3.  From the diagram given on the right, the elements of $(A \cup B)$ are
    **A**  {5}.
    **B**  {3, 4}.
    **C**  {3, 4, 5}.
    **D**  {1, 2, 3, 4, 5}.
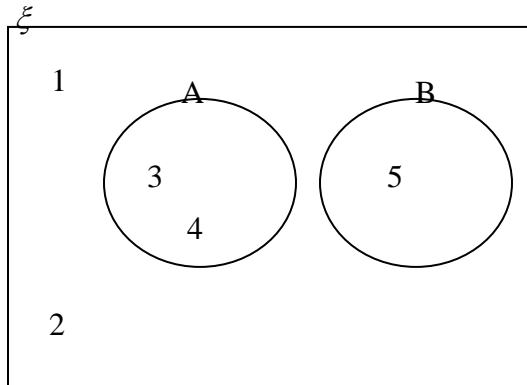
4.  Which of the following fractions has the largest value?
    **A**  $\dfrac{1}{2}$
    **B**  $\dfrac{1}{4}$
    **C**  $\dfrac{1}{10}$
    **D**  $\dfrac{1}{100}$

5. $1\frac{1}{3} - \frac{2}{3} \times 3 \div 3 - \frac{1}{3}$ is equal to

   A $1\frac{1}{3}$.

   B $1\frac{2}{3}$.

   C $\frac{1}{3}$.

   D $3$.

6. What is the missing numeral in the open
   sentence $15(247 - 47) = 15 \times 247 - 47 \times$ _____ ?

   A 247
   B 200
   C 47
   D 15

7. The short form of the $9 \times 10^6 + 5 \times 10^4 + 7 \times 10^3 + 3 \times 10^2$ can be written as

   A 9573.
   B 95730.
   C 9005300.
   D 9057300.

8. The fractional forms of three certain numbers are given by $3 \times 5^2$, $5 \times 3^2$ and
   $7 \times 3^3 \times 5$. Their L.C.M is

   A 1567.
   B 3154.
   C 4725.
   D 9452.

9. What is one quarter expressed as a percentage?

   A 25%
   B 40%
   C 50%
   D 75%

10. A sum of Nu.963.40 when divided in the ratio 2:3:4 gives

    A Nu.321.30, Nu. 214.20 and Nu. 428.40.
    B Nu.107.10, Nu.321.30 and Nu. 428.50.
    C Nu.214.20, Nu.321.30 and Nu.428.40.
    D Nu.428.40, Nu.214.20 and Nu.321.30.

11.     Which of the following is not true?

A    $^-3 \div \dfrac{1}{3} = {}^-9$

B    $^+5 - {}^-5 = {}^+10$

C    $\left|{}^-6\right| \times {}^-6 = {}^-36$

D    $8..2 + ({}^-0.2) = {}^+8$

12.     All the following are examples of a single term EXCEPT

A    $2(x-2)+5$

B    $\dfrac{(x^2-1)+3}{5}$

C    $250\,xyz$

D    $\dfrac{3a^2x}{2}$

13.     The expression $(2x+3y-5)$ when subtracted from the sum of (3-2x) and 94 gives

A    $12y-2$.

B    $4x-6y-8$.

C    $-4x+6y+8$.

D    $-4x+6y-2$.

14.     Simplification of $(2x-3y)(x+3y)$ is

A    $2x^2 +3xy -9y^2$.

B    $3xy +3x^2 -9y^2$.

C    $2xy +3x^2 -9y^2$.

D    $2x^2 y +3x^2 -9y^2$.

15.     $2(3x)-2 = 10$ is

A    10.

B    8.

C    4.

D    2.

16.      Given x=4, the value of $y$ from the given equation $4x-3 = 2y+1$ is

A    4.

B    6.

C    10.

D    14.

17. Five times a number increased by 5 is 60. What is the number?
   A   4
   B   10
   C   11
   D   15

18. What is the product of $0.00297 \times 100000$ ?
   A   297
   B   97
   C   0.0297
   D   0.00297

19. If one of the base angles of an isosceles triangle is $42^0$, then the measure of its vertical angle is
   A   $42^0$.
   B   $84^0$.
   C   $96^0$.
   D   $138^0$.

20. The diagram on the right shows two paints of parallel lines. $\overrightarrow{M}$ is parallel to $\overrightarrow{N}$ and $\overrightarrow{B}$ is parallel to $\overrightarrow{P}$. The sum of angles $x$, $y$ and $z$ is equal to
   A   $260^0$.
   B   $300^0$.
   C   $320^0$.
   D   $400^0$.

21. An area of $2.5 \text{ m}^2$ equals
   A   $250 \text{ cm}^2$.
   B   $2500 \text{ cm}^2$.
   C   $25000 \text{ cm}^2$.
   D   $250000 \text{ cm}^2$.

22. How many sugar cube each having a volume of $8 \text{ cm}^3$ can be packed in a cartoon box of size 40 cm, by 30 cm by 20 cm?
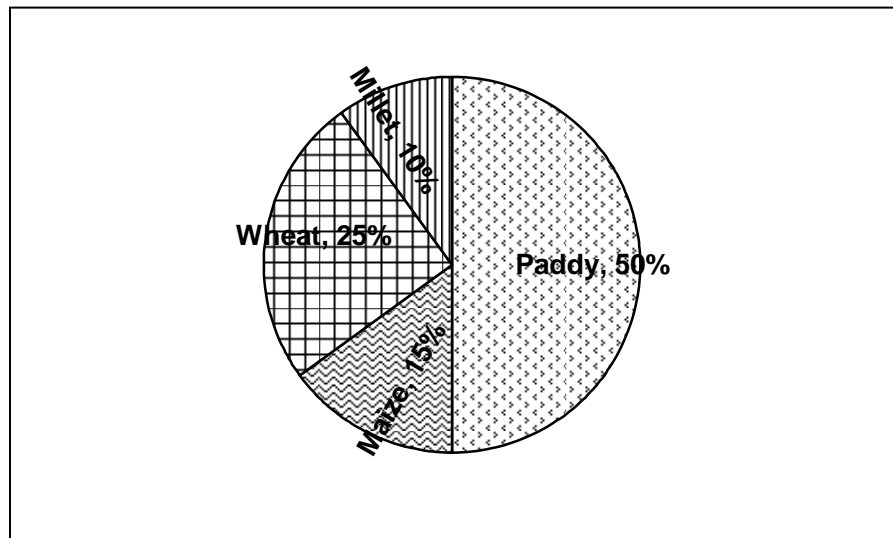   A   24000
   B   3000
   C   1200
   D   800

23. The column graph shows boys and girls in classes III to VI in a primary school. The total number of boys in classes III, V and VI is

   **A**   230 boys.
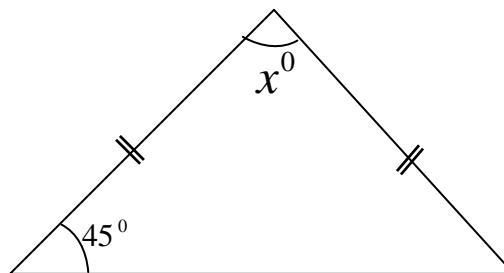   **B**   180 boys.
   **C**   170 boys
   **D**   150 boys
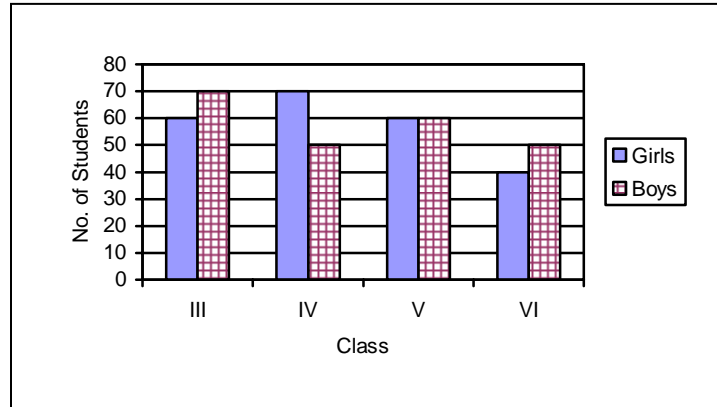


24. In a village different types of crops are grown as shown by the pie-diagram. The central angle occupied by maize is

   **A**   $36^0$.
   **B**   $54^0$.
   **C**   $90^0$.
   **D**   $360^0$.



25. In the diagram on the right, an angle $x^0$ represents
   **A**   a supplementary angle.
   **B**   an obtuse angle.
   **C**   an acute angle.
   **D**   a right angle.

**SECTION B**
**5 questions [50 marks]**
**Answer ALL questions**

*Directions: Answer the questions given below as directed. All answers should be written in the answer booklet provided by the school. The intended marks for each question is given in the brackets [ ].*

**Question 1**

a.      Dorji attends a drawing club every 20 days, Tenzin in every 15 days and Kinley every 10 days. If all three attended the drawing club on 1$^{st}$ June, when will they meet again in the same drawing club?                                   **[3]**

b.      Simplify $2\dfrac{1}{4} \times 1\dfrac{1}{3} \div 1\dfrac{1}{5}$.                                   **[1]**

c.      Given $a = \dfrac{-2}{3}, b = 0, c = \dfrac{1}{5}$, find the value of $\dfrac{9a^2}{2} + 4b^2c - c$.                                   **[2]**

d.      Sets $M$ and $N$ are two intersecting sets. If $n(M)=10$, $n(N)=8$ and $n(M \cap N) = 3$. Find $n(M \cup N)$ using the cardinal notation.                                   **[2]**

e.      The pie-diagram on the right shows three types of fruit trees in an orchard. Find the number of apple threes if there were a total of 1080 trees in the orchard. **[2]**
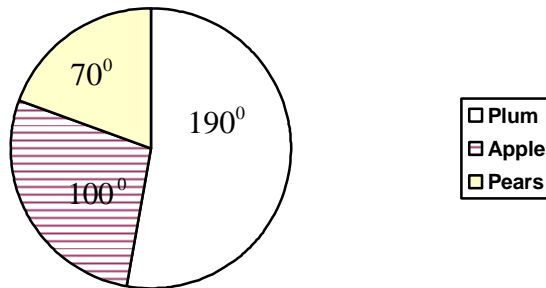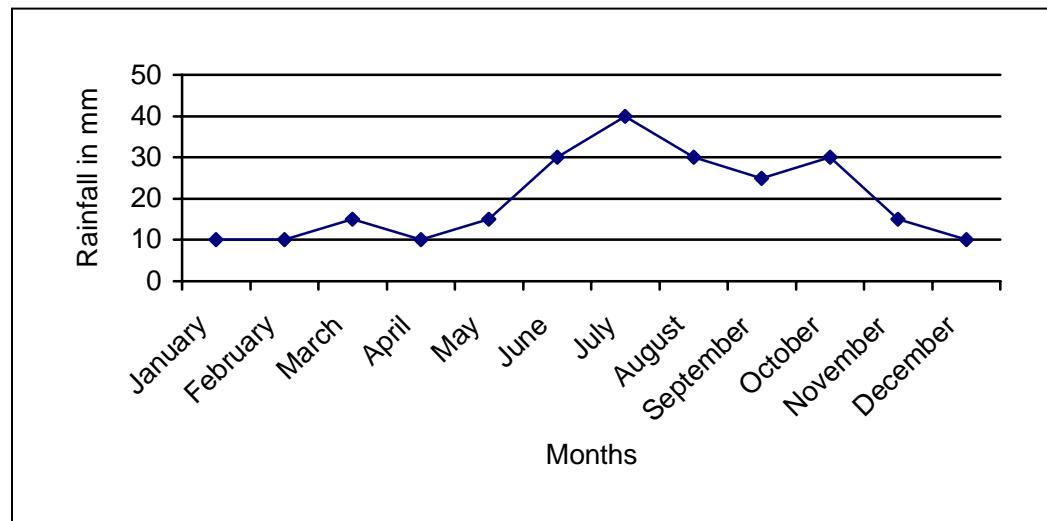


**Question 2**

a.      $r \in W$, then $r \times r \times x =$_____. What is the missing numeral?                                   **[1]**

b.      $\dfrac{2}{3}$ of a boy's pocket money is spent for buying a gho, $\dfrac{1}{3}$ for a pair of shoes and Nu. 120 was left. What was the total of his pocket money?                                   **[3]**

c.      Write the sum of $\dfrac{4}{1000} + 3 \times \dfrac{1}{10}$ in decimal notation.          **[1]**

d.      Tashi bought a radio for Nu. 800 and sold it at a loss of $15\dfrac{1}{2}\%$ . What was his

        selling price?          **[2]**

e.      Construct a $\triangle PQR$ given $\overline{PQ} = 6.5$ cm, $\overline{QR} = 4$ cm and $\overline{PR} = 6.5$ cm. Measure
        all the angles and name the kinds of triangle constructed.          **[3]**
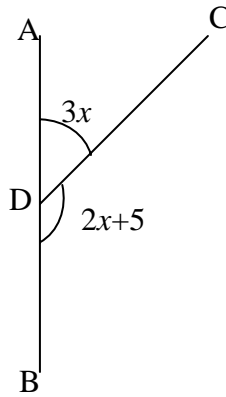
## Question 3

a.      Which angle is complement to $80^{0}$ ?          **[1]**

b.      Express $\dfrac{12}{25}$ as an exact decimal.          **[2]**

c.      A certain sum of money was shared by Dechen, Wangmo and Deki receiving Nu.
        210, Nu.525 and Nu. 630 respectively. What was the ratio of their shares? **[2]**

d.      The line graph on the right shows the monthly rainfall in a year. What was the
        average monthly rainfall?          **[2]**

e.

(i) Given $\overline{AB}$ is a straight line. Calculate $\angle ADC$ and $\angle CDB$ in numerical measures. **[2]**

A      C

$3x$

D    $2x+5$

B

(ii) Solve $^-42 \div {}^-7 - {}^-15 \div 5.$ **[1]**

## Question 4

a. A man puts Nu.5000 in a bank as a fixed deposit for 4 years at 11% per annum simple interest. Find the amount he will get back after 4 years. **[2]**

b. Multiply $(2x^2 - 3y^2)(x^2 + y^2)$ . **[2]**

c. Dorji has a rectangular block of cheese measuring $10 \text{ cm} \times 8 \text{ cm} \times 6 \text{ cm}$ . Find the total surface area of a block. **[2]**

d. The sum of two certain numbers is 87. Find the numbers if one of them is double the other. **[2]**

e. In a class of certain number of students 22 students passed in Dzongkha, 35 passed in English while 7 students passed in both.

Find
(i) How many students passed in English only.
(ii) What was the total students in the class? **[2]**

## Question 5

a. At midnight, the temperature was $^+3^0 C$ . During the next hour it fell by $6^0 C$ and during the following hour rose by $4^0 C$ . What was the final temperature? **[2]**

b. An equilateral triangle of sides $4y$ has a height $x$. Write down the formula for its area and perimeter in simplest form. **[2]**

c.   Solve the equation $\dfrac{3}{4} - 2x = 5x - \dfrac{1}{2}$ .                                           **[2]**

d.   Compare the areas a rectangular field of sides 20 m by 8 m and a square field with a side 8 m? Write the area of the polygon with greater area.                **[2]**

e.   The frequency distribution table given below shows the weight of students in class VI in a primary school.

| Weight (kg) | Tally Marks | Frequency |
|---|---|---|
| 45 | ~~IIII~~ ~~IIII~~ I | |
| 46 | III | |
| 47 | ~~IIII~~ I | |
| 48 | ~~IIII~~ ~~IIII~~ ~~IIII~~ | |
| 49 | ~~IIII~~ II | |
| 50 | ~~IIII~~ | |
| 51 | II | |
| 52 | ~~IIII~~ IIII | |
| 53 | IIII | |
| 54 | ~~IIII~~ III | |
| 55 | ~~IIII~~ ~~IIII~~ | |

Calculate the percentage of students whose weights are less than 48 kg.      **[2]**