

Autumn Semester Examination – 2021

Paro College of Education

Royal University of Bhutan

Paro

**Module:** MAT 404 (Mathematics in Upper Primary 2) **Programme B. Ed (P)** **Level:** IV

**Writing time:** 3 hours

**Full marks: 100**

**Direction:**

Use the first 15 minutes to read the questions. You will get three hours for answering the questions. Write the answers to all the questions in the answer sheets provided. This paper contains SIX questions. Attempt any FIVE questions. All questions carry equal marks and the intended marks are given in brackets. You are expected to use grid papers, Isometric dot and graph papers to answer some of the questions.

**Questions 1**

a. The coordinates of the quadrilateral are  $A(2,5)$ ,  $B(-1,2)$ ,  $C(-4,0)$  and  $D(7,2)$ . [10]

- Plot the quadrilateral  $ABCD$  and write its coordinates.
- Rotate the quadrilateral  $ABCD$   $270^\circ$  CCW to  $A'B'C'D'$  with center of rotation at origin.
- Translate the image of  $ABCD$  as per the mapping notation

$$(x, y) \rightarrow (x - 7, y + 5)$$

b. Tenzin rolled a die for 60 times and recorded the results as shown below.

[10 x 1 = 10]

1	
2	
3	
4	
5	
6	

Determine the probability for each event.

- i. What is the experimental probability of getting 2?
- ii. What is the theoretical probability of getting 2?
- iii. What is the experimental probability of getting an odd number?
- iv. What is the theoretical probability of getting an odd number?
- v. What is the experimental probability of getting a number from 1 to 6?
- vi. What is the theoretical probability of getting of a number from 1 to 6?
- vii. What is the experimental probability of 1 or 6?
- viii. What is the theoretical probability of getting 1 or 6?
- ix. What is the experimental probability of getting 7?
- x. What is the theoretical probability of getting 7?

## Question 2

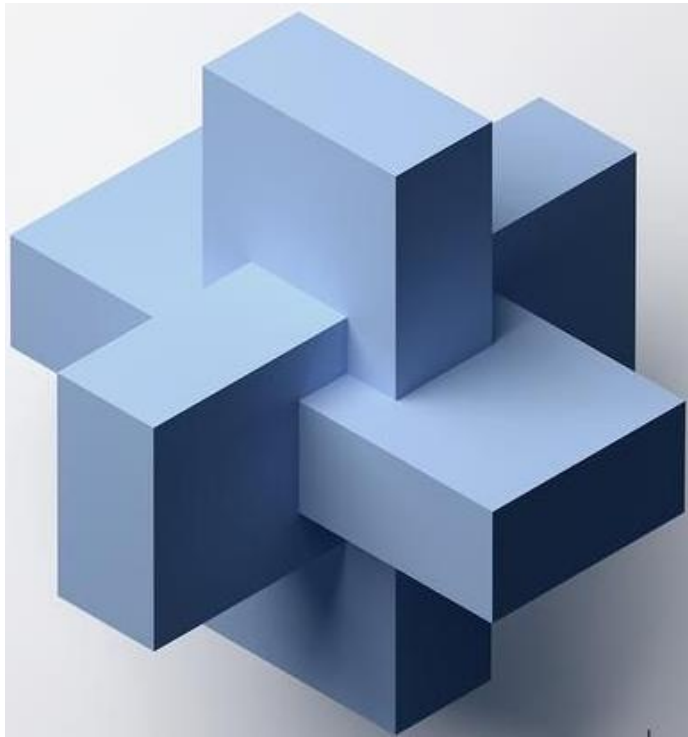
- a. The coordinates of the figure are  $W(-4,3)$ ,  $X(-5,0)$ ,  $Y(-1,-1)$  and  $Z(0,2)$ .

[2+4+4]

- i. Plot the figure  $WXYZ$  and write its coordinates.
- ii. Reflect the figure  $WXYZ$  to  $W'X'Y'Z'$  in the line  $y = -x$ .
- iii. Dilate image  $W'X'Y'Z'$  with center of dilatation at point  $X'$  and scale factor 2.

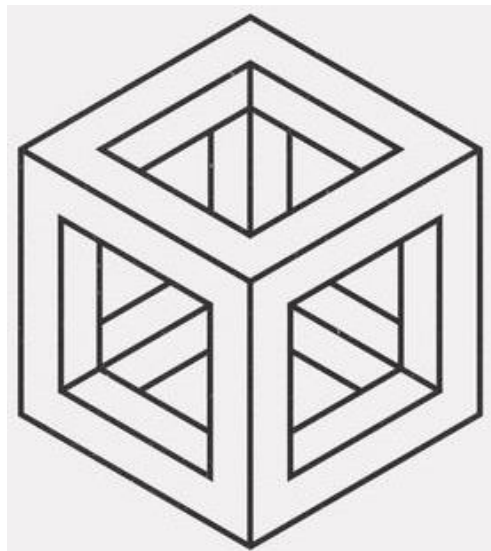
b. Draw the 3 - D diagram below using isometric grid.

[6]



c. Draw the following figure using isometric grid paper.

[4]

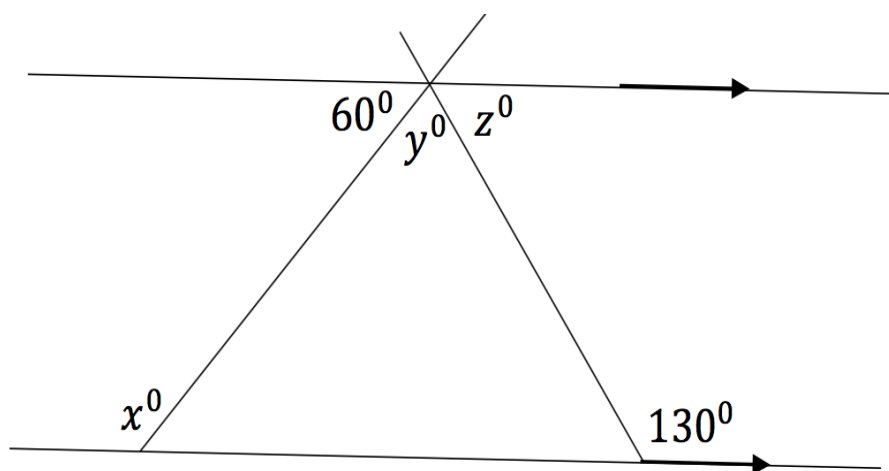


### Question 3

a. Solve the following by using algebra tiles and algorithm: [6]

i. Factor  $4x^2 - 16$

ii. Find the values of  $x$ ,  $y$  and  $z$  from the figure below. Show all justifications and calculation. [8]



iii. Multiply  $(3x - 2y - 2)$  by  $(x - 2y)$  [6]

### Question 4

a. Create a word problem for the equation  $(x + 6) + (x - 4) = 22$  [5]

b. solve using algebra tiles. [5]

c. Divide  $4x^2 + 4xy - 3y^2$  by  $2x - y$  using algebra tiles. [5]

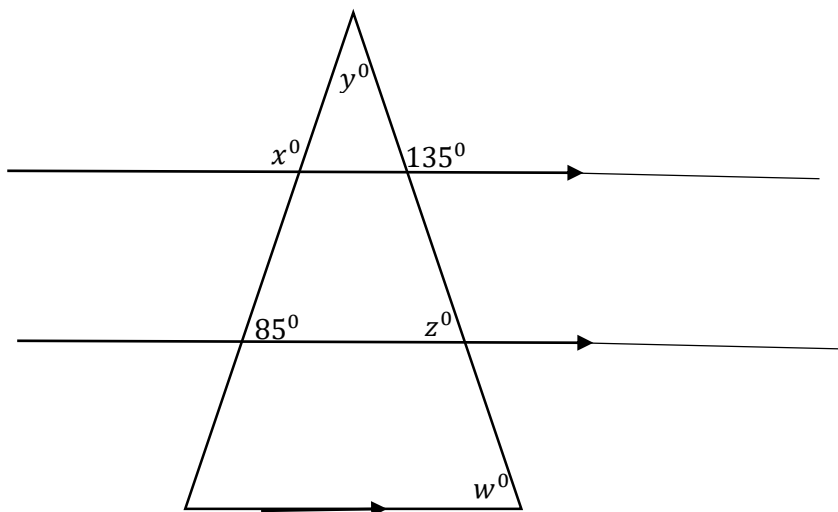
d. Calculate the area of the circular path of a flower garden if the outer diameter is 56 m and the path has a uniform width of 3.5 m? [5]

### Question 5

- a. Make an instruction card to help your students to construct the given figure with the following information: [6]

Triangle ABC in which  $BC = 5$  cm, angle  $ABC = 75^\circ$  and  $ACB = 60^\circ$ .

- b. Find the values of the following angles marked  $w^\circ, x^\circ, y^\circ$  and  $z^\circ$ . [8]



- c. Uden bought a gift for her friend. How much paper will she need to cover a rectangular gift box whose dimensions are 15 cm, 12 cm and height is 0.5 m. [6]

### Question 6

- a. Derive a formula to find the area of a parallelogram. Illustrate by using diagrams. [8]
- b. A number is chosen at random from the set of two-digit numbers from 10 to 49 inclusive. What is the probability: [ 8 ]
- that the number contains at least one digit 2?
  - multiples of 3 and multiples of 4?
  - multiples of 2 or multiples of 5?
  - factors of 50?

c. Draw the following diagram using isometric grid.

[4]

