Spring 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

1.1 The coordinates of the quadrilateral are $A(3,4), B(1,2), C(4,0)$ and $D(7,2)$.   [2+5+3]

   a. Plot the quadrilateral $ABCD$ and write its coordinates.

   b. Rotate the quadrilateral $ABCD$ 270^0 CCW to $A'B'C'D'$ with center of rotation at origin.

   c. Translate the image of $ABCD$ as per the mapping notation

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

1.2 Selden 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 of 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?
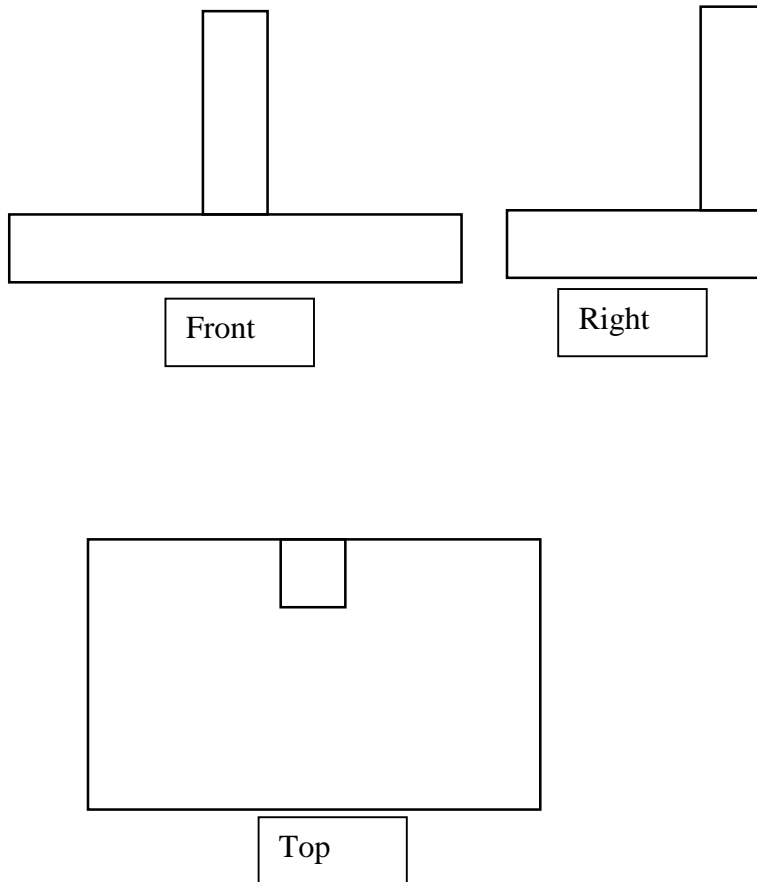
Question 2

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

                                                   [2+4+4]
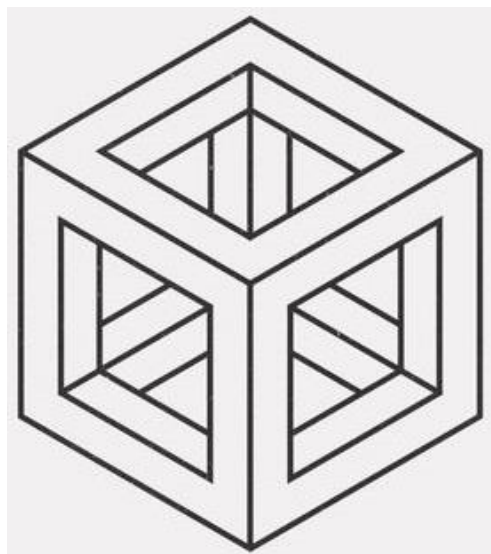
    a. Plot the figure $WXYZ$ and write its coordinates.

    b. Reflect the figure $WXYZ$ to $W'X'Y'Z'$ in the line $y = -x$.

    c. Dilate image $W'X'Y'Z'$ with center of dilatation at point X' and scale factor 2.

2.2 a. Draw the 3 - D diagram of the following views. (Use isometric grid).   [6]

Front

Right

Top

2.2 b. Draw the following figure using isometric grid paper.   [4]
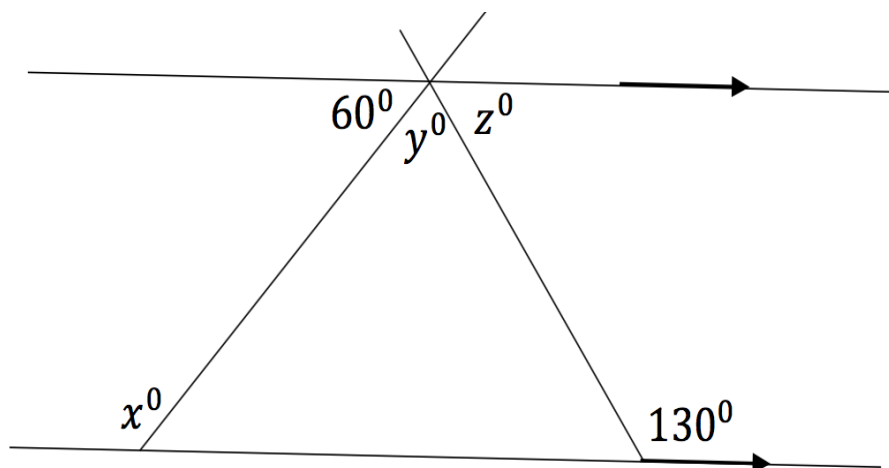
Question 3

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

a. Factor $2x^2 - x - 6$

b. Find the values of x, y and z from the figure below. Show all justifications and calculation. [2+2+2]
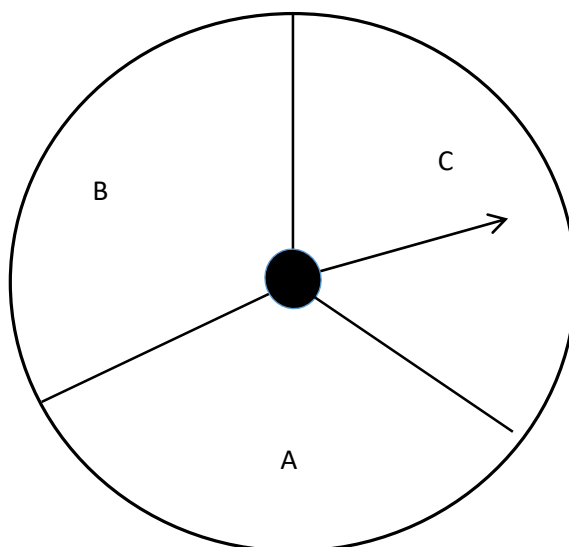

c. Multiply $(x + y - 2)$ by $(x - 2y)$ [4]

d. Seldup says that the theoretical probability of spinning A and B on the spinner will be two-third. Do you agree? Why or why not? [4]
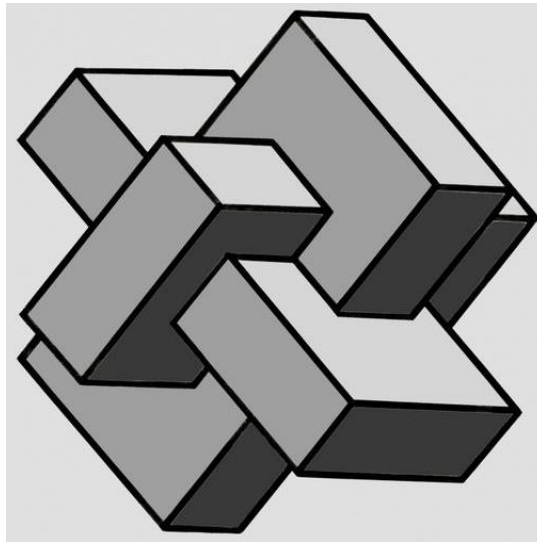
Question 4

4.1 a. Create a word problem for the equation $2x + 6 = 4x$ and solve using algebra tiles.

[5]

b. Divide $2x^2 + xy - y^2 + 4x - 2y$ by $2x - y$ using algebra tiles and algorithm. [5]

c. What would be the area of the circular path of college (PCE) flower garden, if the outer diameter is 28 m and the path is uniform width of 3.5 m? [6]

d. Draw three views (front view, right view and top view) of the following object.

[4]

Question 5

a. Explain in detail how you would help your students to construct the given figure with the following information: [6]

Triangle ABC in which BC = 4.5 cm, angle ABC = 75^0 and ACB = 60^0.

b. Draw and list at least three differences and three similarities between the following pairs of quadrilaterals. [8]

i. square and rhombus

ii. rectangle and parallelogram

c. Jigme bought a birthday gift for her friend. How much paper will she need to cover a gift packet (rectangular box) having dimensions: length is 15 cm; width is 12 cm and height is 0.5 m. Show the procedures in detail.   [6]

Question 6

a. Derive the formulas for finding a total surface area of the closed cylinder as $2\pi r^2 + 2\pi rh$ using appropriate illustrations.   [8]

b. Create an event to match each theoretical probability.   [6]

    i.   90%
    ii.   0.5
    iii.   1
    iv.   0

c. Draw the 3 - D diagram of the following views. (Use isometric grid provided to you).
                                                                                                          [6]

Front view

Top view

Left view