

Royal University of Bhutan  
Paro College of Education  
Autumn Semester Examination – 2014

**B Ed Primary Year IV –Upper Primary Math II (MAT 404)**

**Full mark: 100**

**Time: 3 hours**

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**Instruction:** You are NOT allowed to use any electronic device. You will be supplied with Grid paper, square dot paper and Isometric grid paper to answer some of the questions. The actual time allotted to answer the paper is 3 hours. The first ten minutes is to be spent in reading questions.

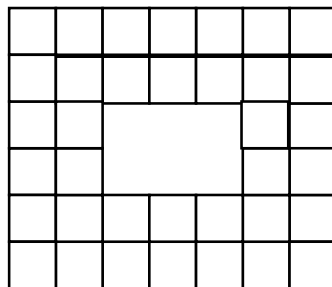
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**(5 x 20 marks = 100)**

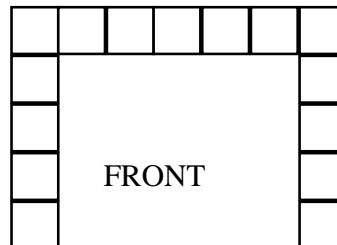
**Instruction:** This paper contains six questions. All questions carry equal marks. Mark for each sub question is given in the square bracket.

**Question 1**

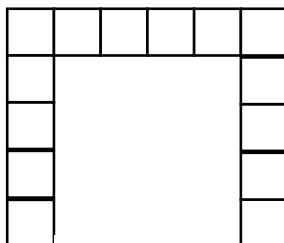
- a) Draw diagram of the object whose front face, left face, right face, top face and back face is given in the diagram below. [7]



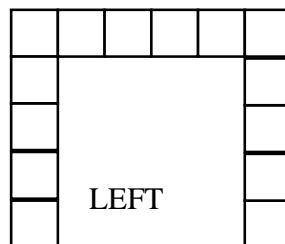
TOP



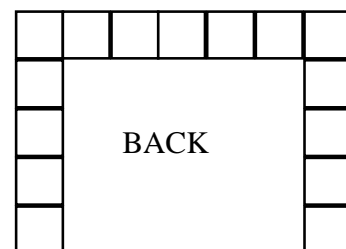
FRONT



RIGHT

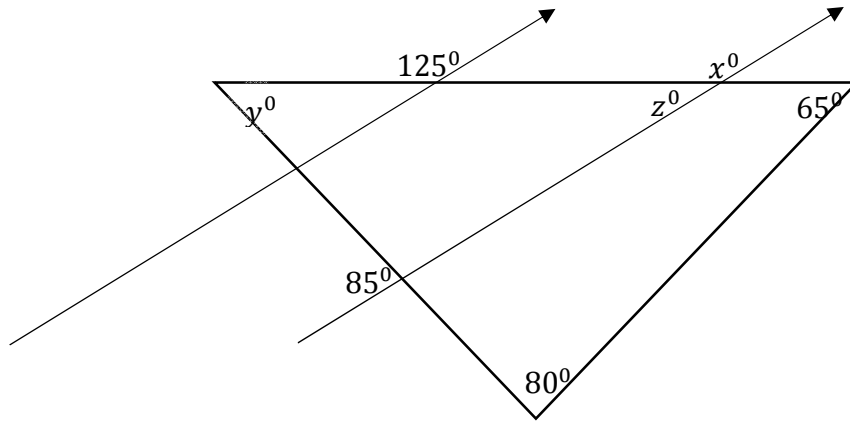


LEFT

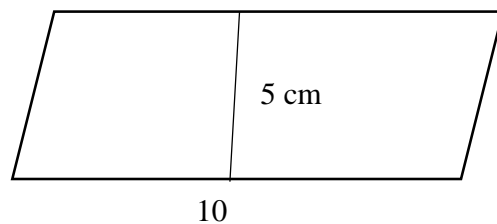


BACK

- b) Find the angles marked  $x^\circ$ ,  $y^\circ$  and  $z^\circ$  in the diagram below. Show all your calculations with reasons or explanation.[5]



- c) i. Derive a formula to find the area of a parallelogram. [8]  
 ii. Find the area of the following figure using the derived formula.



## Question 2

- a) Factor  $x^2 - 4xy + 4y^2$  using algebra tiles [6]

- b) Observe the figures given below: [6]

- Complete the missing figures
- Explain the pattern
- Express the pattern algebraically



Figure I



Figure II

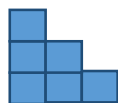


Figure III

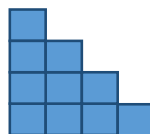


Figure IV

Figure V

Figure VI

c) List the sample space and find the sample space of the following: [8]

- i. Tossing two coins and rolling a die simultaneously.
- ii. Tossing a coin, spinning a spinner with three division (A, B, C) and rolling a die simultaneously.

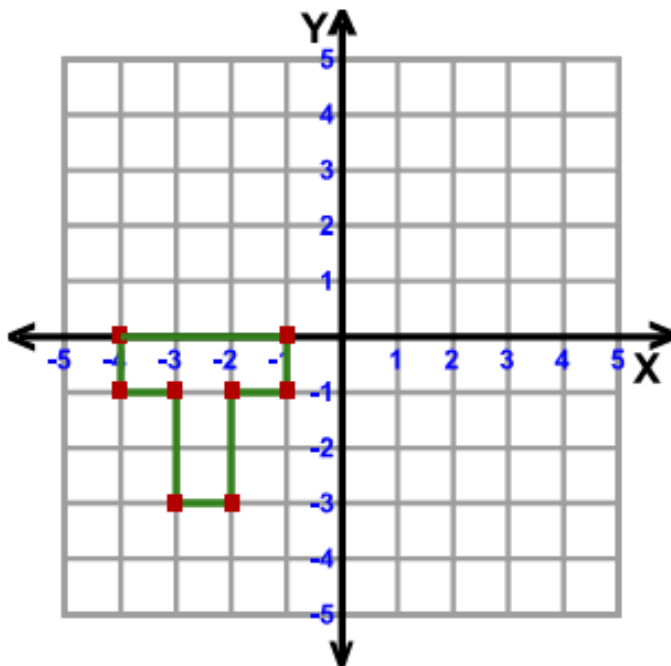
### Question 3

a) Draw a tree diagram of sample space of the following: [8]

- i. when we toss a single coin.
- ii. When we toss two coins simultaneously.
- iii. When we toss three coins simultaneously.
- iv. Derive a rule to calculate sample space.
- v. Use the rule to calculate the sample space when we toss two coins, roll a die, and spin a spinner with 4 division (A, B, C, D) simultaneously.

b) Factor  $9x^2 + 12xy + 4y^2$  using algebra tiles. [6]

c) Use different grid paper for each transformation. [6]



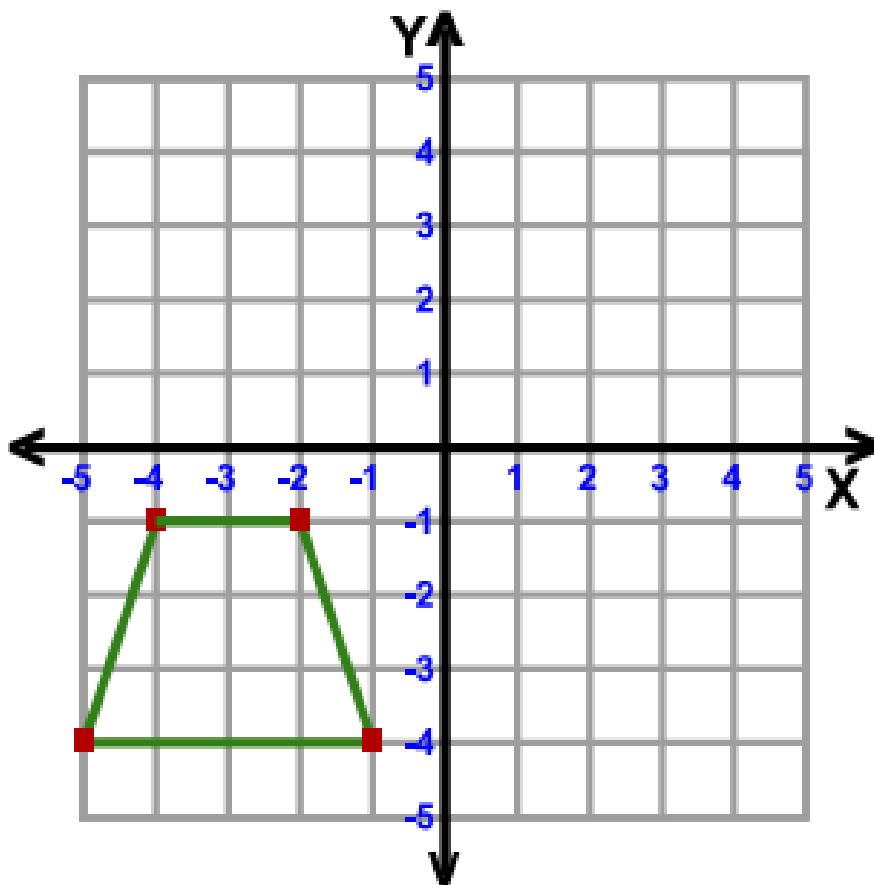
- i. Label the figure as ABCDEFGH with coordinates.
- ii. Reflect the figure in the origin.
- iii. Translate the figure as:  $T \rightarrow (x + 5, y + 4)$
- iv. Reflect the figure in the  $X = Y$  axis.

#### Question 4

a) Convert the following by using diagram and pattern/relationship/formula and explain wherever necessary. [6]

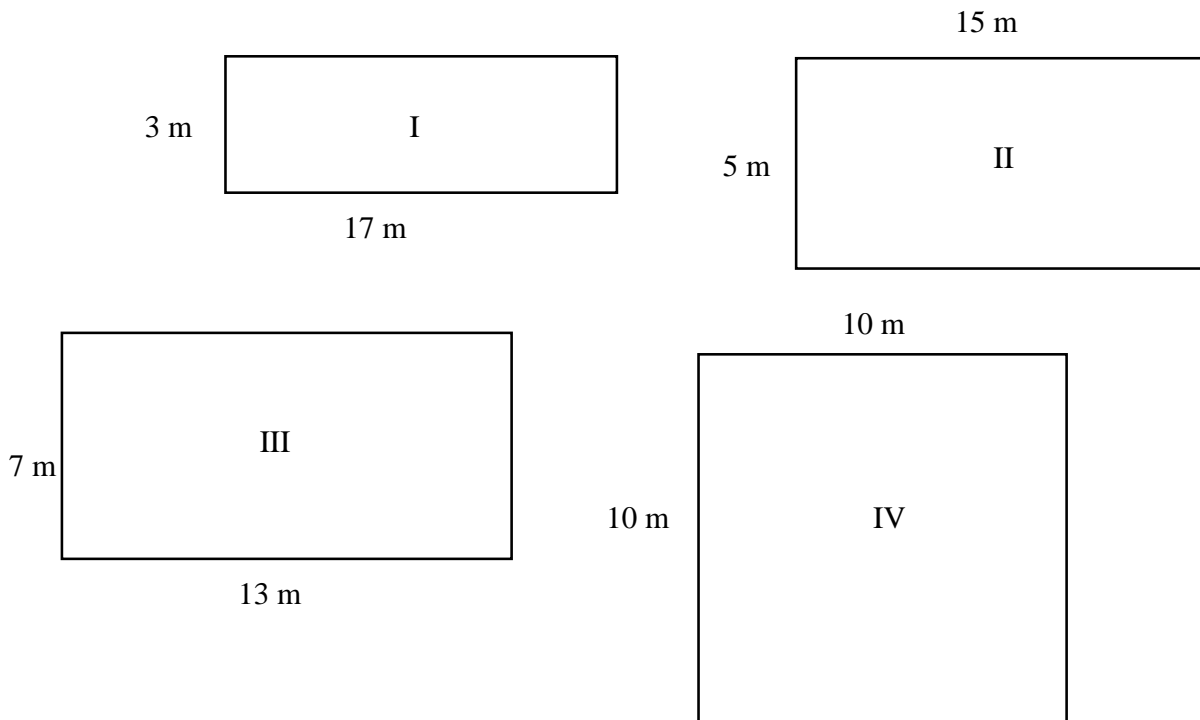
- i.  $5 \text{ km}^3$  to  $\text{cm}^3$       ii.  $34567 \text{ m}^2$  to  $\text{km}^2$

b) Use different grid paper for each transformation. [6]



- i. Label the figure as ABCD with coordinates  
ii. Rotate the figure  $90^\circ$  clockwise  
iii. Reflect the figure in the  $Y = -X$  axis

c) You are given 4 plots as follows: [8]



- i. Choose one plot to grow vegetable. Give reasons and explain.
- ii. Choose a plot to construct a house. Give reasons and explain.

### Question 5

a) Karma is a class V student. She was asked to convert  $5 \text{ km}^2$  to  $\text{m}^2$ . [6]

Karma's solution was:  $5 \text{ km}^2 = 25 \text{ m}^2$

- i. Find Karma's mistake(s) and explain.
- ii. How will you correct Karma's mistake(s)?
- iii. How will you teach Karma the right method to convert from  $\text{km}^2$  to  $\text{m}^2$ . Explain.

b) There are 7 blue socks, 5 red socks, 3 green socks and 4 yellow socks in a drawer. [8]

- i. Find the sample space
- ii. How many socks should I take out without looking so that I get a pair of socks?
- iii. What is the probability that the first sock that I draw will be red?

iv. What is the probability that the second socks that I draw will be yellow if I don't replace the first sock?

c) i. Plot the four sided figure ABCD in the grid paper where A(2, 2), B(4, 5), C(9, 0) and D(11, 2). [6]

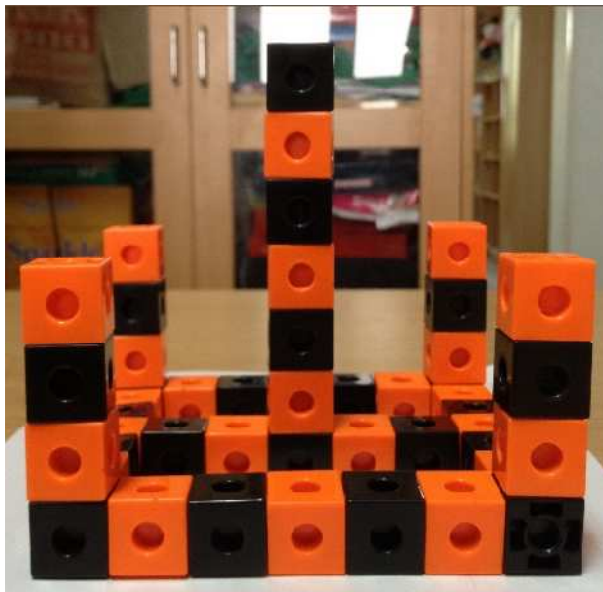
ii. Label the vertices and write the coordinates.

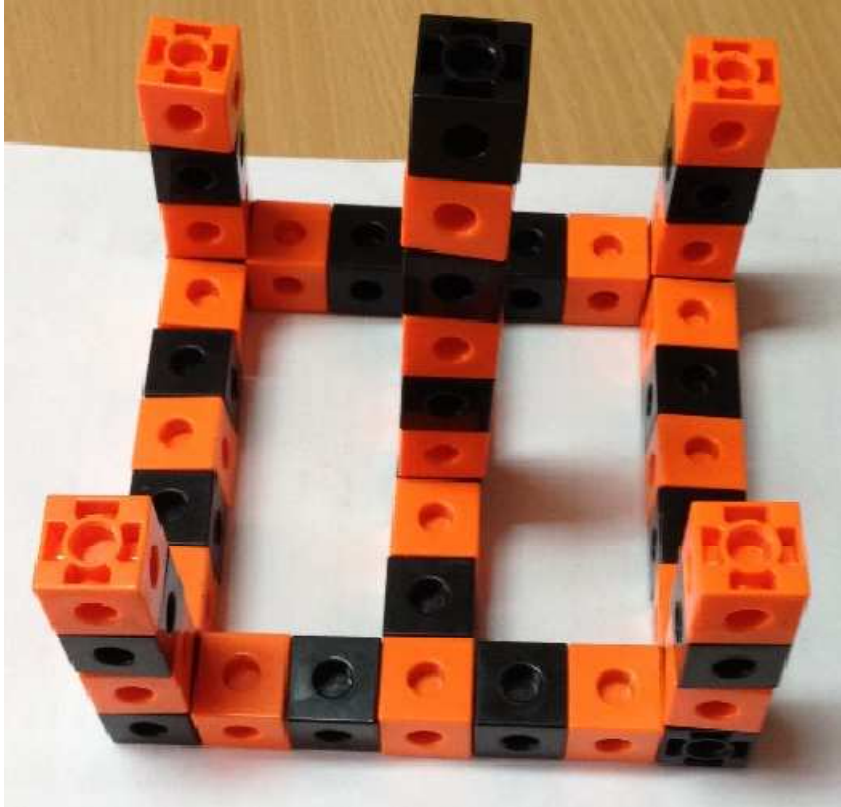
iii. Reflect the figure in the Y – axis as  $A'B'C'D'$ .

iv. Rotate  $A'B'C'D'$   $90^\circ$  counterclockwise to  $A''B''C''D''$ .

### Question 6

a) The following are photographs of an object taken from different angles. Draw this object using isometric dot paper. [6]





- b) Construct a rectangle ABCD where  $AB = 6$  cm and  $BC = 4$  cm and write a set of instruction to construct the rectangle ABCD. [6]
- c) Construct the following: [8]
- Triangle ABC where  $AB = 7$  cm, angle  $ABC = 75^\circ$  and angle  $CAB = 45^\circ$ .
  - Bisect a line segment  $AB = 7$  cm and write the instruction.