# Uganda Martyrs University

**FACULTY OF EDUCATION**
**SEMESTER ONE EXAMINATIONS 2022/23**
**BACHELOR OF EDUCATION (PRIMARY) YEAR TWO**
**MATHEMATICS EDUCATION**
MENSURATION AND ACTION RESEARCH IN MATHEMATICS

**DATE: Fri 13/01/2023** **3hrs** **Time: 2.00-5.00 PM**

**Instructions:**
- **Follow instructions on this question paper and answer booklet carefully.**
- **Do not write anything on this question paper.**
- **Attempt any FOUR questions, choosing THREE questions from Section A and ONE question from Section B.**
- **Begin each selected question on a new page in the answer booklet.**
- **All questions carry the same marks (25 Marks for each question).**

## SECTION A: MENSURATION - choose THREE questions

### Question 1

a) What is perimeter? Using your understanding of perimeter, derive the formula for the perimeter of a circle. (08 marks)

b) The perimeter of a square, whose sides are $x$ cm, is 40 cm. Find the;

i) value of $x$, (04 marks)

ii) area of the square. (03 marks)

c) Figure 1 shows the top of a table at the reception of a certain company.

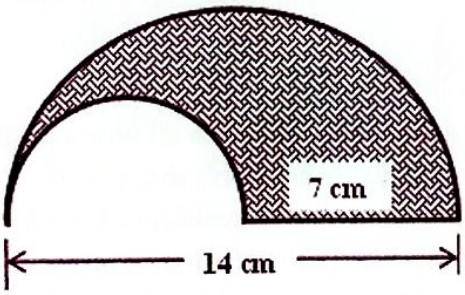


**Figure 1**

It consists of two semicircles of diameters 14 cm and 7 cm. Calculate the;

i) perimeter of the top of the table, (05 marks)

ii) area of the shaded part of the table. (05 marks)

### Question 2

a) Differentiate between volume and capacity. (05 marks)

b) A water tank has the shape of a cuboid with a square base of 5 m. If the height of the tank is 6 m, how many litres of water can it hold? (05 marks)

c) A truck carries a maximum load of 4.3 tonnes. How many bags of cement each 50 kg, can this truck carry if some space is spared for 120 iron sheets each weighing 950 g? (07 marks)

d) Mr. Okello took his two children to church one Sunday in his car which has a weight

e) of2500 N. If Mr. Okello s weight is 800N and his children weigh 42 kg and 58 kg. Determine the;

i) weight of the car together with the occupants,(05 marks)

ii) mass of the car together with the occupants. (03 marks)

**Question 3**

a) The local time in Town A (35°,75°) is 8 a.m., find the local time in Town B(0°, 38°). (05 marks)

b) The tuition fees in a certain public university were increased by 15% for every new entrant. This led to a strike and several properties were destroyed. If a student currently pays 1.2 million shillings, estimate how much a freshman who applies for the same course will at the beginning of the next academic year. (05 marks)

c) A trader bought an article at shs. 700,000 and sold it making a profit of shs. 140,000. Find his selling price and his percentage profit. (05 marks)

d) i)Paul invested shs. 150,000 at 10% per annum simple interest. How much interest did he earn after 2 years? (05 marks)

ii) If Paul had invested the same amount for the same time at 10% per annum compound interest, find the interest he would have earned over the one in c(i) above.(05 marks)

**Question 4**

a) Define the following terms as used in business arithmetic.

i) profit, (02 marks)

ii) discount, (02 marks)

iii) interest. (02 marks)

b) A store gave its customers a discount of 25% on all its goods during the Christmas season. Find how much a customer pays for a sofa set worth shs. 4,000,000. (04 marks)

c) i) A tourist traveled with his family and he withdrew, from his bank account, $2000. He spent shs. 1,000,000 on accommodation, shs. 1,020,000 on transport and shs. 400,000 on entrance in the park. If $1=Ushs.3800, find how many dollars he has left after the trip. (05 marks)

ii) Given that £1=$1.75 and £1=Ushs.5,500, find how many dollars one can buy using shs. 1,050,000. (05 marks)

d) Find how many 250 ml bottles of water can be filled from a 20-litre jerry can. (05 marks)

## SECTION B: ACTION RESEARCH IN MATHEMATICS

**Choose ONE question from this section.**

### Question 5

a) i) What is action research as applied to the teaching and learning of mathematics? (04 marks)

ii) Why do you think action research is important in teaching mathematics? (06 marks)

b) Explain the common problems experienced in the teaching and learning of mathematics in primary schools. (15 marks)

### Question 6

a) Explain why both curriculum and test developers should do action research. (10 marks)

b) As a teacher of mathematics, explain why you need action research. (10 marks)

c) Use action research to explain, step by step, how you can help a learner who presents his solution as below.

$$4(x-1) = -2(x-2)$$

$$4x - 1 = -2x - 2$$

$$4x - 2x = -2 - 1$$

$$2x = -3$$

$$x = -\frac{3}{2}$$

(05 marks)

**END**