SENIOR FOUR MATHEMATICS

Scenario-Based Examination Paper 2

Time: 2 Hours 30 Minutes

Instructions

Answer all items in Section A

Answer ONE item from Part I and ONE item from Part II in Section B

Answer FOUR items in total

Non-programmable scientific calculators and mathematical tables may be used

Show all working clearly

Section A (Compulsory)

Item 1

A youth savings group in Gulu started a mobile money agency business. Mariam invested shillings 5,400,000 while Isaac invested shillings 3,600,000. They agreed to share profits in proportion to their investments.

At the start of operations, the number of registered customers was recorded as (324) base five. After six months, the business made a profit of shillings 1,800,000, which was fully reinvested. As a result, the number of customers increased to 486.

The partners agreed to review transaction records every 16 days and service their equipment every 24 days. Both activities were first done on 3rd June 2025.

Task

A. Determine the amount of profit invested by Mariam.

B. Calculate the percentage increase in the number of customers.

C. Find the next date when both activities will occur on the same day.

Item 2

A poultry farmer rears broilers and layers. The farmer must rear at least 120 broilers and not more than 90 layers. Each broiler requires 1.5 kilograms of feed per week while each layer requires 2 kilograms. The farmer has at most 330 kilograms of feed available per week.

The profit on one broiler is shillings 9,000 and on one layer is shillings 12,000. The farmer is not sure how many broilers and layers to rear to maximize profit.

Task

A. Represent the above conditions using inequalities.

B. Draw the feasible region on a Cartesian plane.

C. Determine the number of broilers and layers that should be reared to maximize profit and state the maximum profit.

Section B

Part I (Answer ONE item from this part)

Item 3

A transport officer conducted a study on possession of transport-related documents among 85 drivers. The documents considered were a driving permit, roadworthiness certificate, and national ID card.

From the study, 19 drivers had none of the documents. A total of 40 drivers had driving permits, while 31 had roadworthiness certificates. Four drivers had all the three documents. Eleven drivers had only driving permits, and 7 had only roadworthiness certificates. The number of drivers who had both a national ID card and driving permit only was three more than those who had both a roadworthiness certificate and driving permit only but no national ID card.

Task

A. Determine the number of drivers who had national ID cards.

B. State whether enforcement of document possession should be strengthened, giving a reason.

Item 4

The following data shows the daily water consumption (in liters) of 50 households in a trading center:

28, 34, 41, 56, 47, 38, 62, 59, 45, 36,
52, 48, 40, 33, 61, 54, 49, 44, 37, 58,
46, 55, 63, 35, 42, 50, 60, 39, 32, 57,
51, 43, 48, 41, 36, 59, 54, 47, 45, 38,
62, 40, 34, 56, 49, 52, 58, 44, 46, 53

The local council wants to analyze the data using class intervals of width 10.

Task

A. Construct a grouped frequency distribution table for the data.

B. Determine the median daily water consumption.

C. Find the number of households whose daily water consumption is 44.5 liters or less.

Part II (Answer ONE item from this part)

Item 5

A carpenter plans to make a cylindrical water tank stand with a circular base area of 615.8 square centimeters. A client may either pay shillings 500,000 in cash or pay a deposit of shillings 240,000 followed by two equal monthly installments of shillings 145,000 each.

The carpenter intends to cut a circular base from a triangular wooden board. Two sides of the triangle measure 70 centimeters and 50 centimeters with an included angle of 60 degrees.

Task

A. Determine the cheaper payment option and justify your answer.

B. Establish whether the largest possible circular base that can be cut from the board will fit the tank stand.

Item 6

A school plans to construct a triangular flower garden surrounded by a circular path. Two sides of the garden measure 60 meters and 84 meters, and the angle between them is 60 degrees. The circular path passes through all the three vertices of the triangular garden.

The area between the garden and the circular path will be covered with grass at a cost of shillings 25,000 per square meter.

Task

A. Draw an accurate construction of the design.

B. Identify the type of triangle formed and give a reason.

C. Calculate the total cost of grassing the region between the triangle and the circular path.

END OF PAPER 2