ALEBTONG COMPREHENSIVE SECONDARY SCHOOL

P.O.BOX 1090, LIRA (U)

Competency based curriculum TERM II 2024

S.1 MATHEMATICS

Duration 2 Hours

Instructions

Answer all items in section A and any two items from section B

SECTION A

Item 1

A construction crew is building a new access road to connect a highway with a nearby industrial park. The highway runs in a north-south direction, while the industrial park is located to the east of the highway. The construction plans specify that the new access road must be oriented at a 45-degree angle relative to the highway.

Given:

- The highway runs in a north-south direction.

- The new access road must be oriented at a 45-degree angle relative to the highway.

Tasks:

a) What is the bearing of the highway?

b) What is the bearing of the new access road?

c) What is the included angle between the highway and the new access road?

Item 2

A computer scientist is working on a program that needs to perform arithmetic operations on numbers in different number bases. The program needs to be able to convert between decimal, binary, and hexadecimal number systems.

Given:

- The program needs to perform arithmetic operations on numbers in decimal, binary, and hexadecimal number systems.

- The program needs to be able to convert between these number systems.

Tasks

a) How would you represent the number 123 in binary and hexadecimal?

b) How would you add the binary numbers 1010 and 0111?

c) How would you convert the binary number 10101010 to decimal?

SECTION B

Item 3.

You work as a data analyst for a sugar manufacturing company. The company's management team has asked you to analyze employee productivity and create a report to present your findings.

The company has provided you with two datasets:

- A spreadsheet containing Total salary payment of UGX 2,000,000.

-A separate spreadsheet with employee quantity of goods produced monthly.

Your task is to analyze this data to identify trends and insights related to employee productivity.

Extract of the spreadsheets as provided.

Employees	Quantity of goods produced (kg)	Monthly salary for 6 months
Bernard	150	400000=
Clente	300	60% more of Bernard's salary
Sylvia	292	590000
Rose	108	The rest of the remaining balance

Tasks

(a) Which employees are the most and least productive based on tasks completed per month worked?

(b) Are there any differences in salary earned per employee?

(c) What recommendations can you provide to improve overall employee productivity?

Item 4

You are a civil engineer working on a new road construction project. The road needs to be built in a straight line between two existing landmarks. The coordinates of the two landmarks are as follows:

Landmark A: (2, 5)

Landmark B: (8, 11)

(a) Locate the positions of the two landmarks. Show your work.

(b) If you need to place a sign post along the road at a point that is equidistant of 10cm from the two landmarks, what are the coordinates of that point? Explain your reasoning.

(c) What is the bearing of the sign post from the;

(i) Landmark A

(i) Landmark B

Item 5

You are a construction project manager overseeing the renovation of an office building. As part of the project, you need to install new flooring in several rooms. The total floor area that needs to be covered is 2,500 square feet.

You've received bids from three different flooring contractors, each offering a different type of flooring material. The details are as follows:

-Contractor A: Offers wood flooring at $4.50 per square foot. They can cover 4/5 of the total floor area.

-Contractor B: Offers laminate flooring at $3.75 per square foot. They can cover 0.6 of the total floor area.

-Contractor C: Offers tile flooring at $5.25 per square foot. They can cover 0.75 of the total floor area.

Given that 1$ in UGX is 37,32

Tasks;

(a) What is the total floor area covered by;

(i) Contractor A.

(ii) Contractor B.

(iii) Contractor C.

(b) what will be the total cost of the flooring for?

(i) Contractor A

(ii) Contractor B

(iii) Contractor C, what will be the total cost of the flooring?

(c) Which contractor offers the lowest cost per square foot of flooring?

THE END