S.4 MATHEMATICS HOLIDAY ASSIGNMENT. (DEC−2024 TO JAN−2025).

INSTRUCTIONS:
*Attempt **all** the items in this paper.*
Solutions should be written in a book and show all the working.

ITEM ONE

David is a poultry farmer in Mukono, he acquired a loan from Centenary Bank of **Shs 800, 000** and this amount was divided in a ratio **5:3:2** for feeds, medication and water supply. He is supposed to pay back the money for feeds in three installments, **40%** in the first installment $\frac{2}{5}$ of the remainder of the money in the second installment and the rest in the third installment.

David is supposed to buy feeds, but he discovers that he has feeds enough to feed **300** chickens for **20** days. He plans to buy **100** more chicken but he is not sure how long the same feeds will last.

Task:
Help David to determine:
(a) The amount of money available for medication.
(b) How much he will pay for feeds in the third installment.
(c) The number of days the same feeds will last after buying more **100** chickens.

ITEM TWO

A businessman buys motorcycles at **Ugx 4,800,000** and gives them to motorcycle riders who are supposed to give him **Ugx 10,000** daily except for Sundays. After **2** years he resells these motorcycles for **Ugx 2,200,000.** One day this businessman went to a school to seek a vacancy for his daughter who had a first grade. He found that the school fees, Admission fees and uniform fees are **Ugx 810,000, Ugx 50,000** and **Ugx 250,000** respectively. The school offers **30%** discount off school fees, free admission and seventy−five thousand shillings off uniform for those with first grade. The school also has two payment plans and they are:

- Paying three quarters of all dues at the beginning of term and the balance on visitation day.
- Paying three equal installments; at the beginning of term, on visitation day and at the end of term respectively.

The parent plans to use his income for three months from one motorcycle to pay fees for his child.

Task
(a) By what percentage will the price of motorcycle have reduced after 2 years.
(b) (i) How much will the businessman pay for his daughter after getting bursary?
(ii) Will the businessman afford school expenses with his income for three months from one motorcycle.
(c) How much do those who pay school fees of **Ugx 810,000** pay per installment according to each of the payment plans?

ITEM THREE

The business department of your school has organised a study trip to a certain poultry farm. The department plans to use taxis and costa buses. The taxi carries a maximum of **15** students while the maximum capacity of costa bus is **30** students. The number of taxis is to be greater than the number of costa buses. The taxis will be **less than** five. The cost of hiring a taxi is **Ugx 60,000** while that of a costa bus is **Ugx 100,000.** There is a maximum of **Ugx 600,000** available for transport.

(a) Write down mathematical relationships to represent the above situation.

(b) Using your mathematical skills, advice the department on how many taxis and costa buses which are full must be ordered so that all the students are transported to the poultry farm.

ITEM FOUR

The Uganda cranes team is in preparation for a game next week in South Africa. In order to watch the match live in the Stadium, Your dad decided to buy **2** tickets for adults and **4** tickets for children and altogether he spent **1,400** dollars. Your Uncle also decided to buy **3** tickets for adults and 1 ticket for their only child and altogether he spent **1000** dollars but they were not sure of the price of an adult ticket and a child's ticket separately.

The welfare manager of the team has **Shs1, 200,000** available and ordered for the following drinks from the supplier to be used for the two days of training which were Thursday and Friday. On Thursday he ordered for **10** boxes of water, **6** boxes of juice and **5** boxes of energy drink. On Friday he ordered for **8** boxes of water, **3** boxes of juice and **6** boxes of energy drink. The supplier sells a box of water at **Shs20, 000**, a box of juice at **Shs35, 000** and a box of energy drink and **Shs40, 000.**

Task:

(a) Help your Dad and your Uncle to determine the price of the adult's ticket and a child's ticket.

(b) Determine the amount of money which will be spent by the welfare manager of the team.

(c) Will the money be enough to cater for the training for the two days? Give a reason for your answer.

ITEM FIVE

The Mathematics teacher in your stream wanted to conduct remedial lessons if the probability of a student passing at least two test items was below **60%.**

A total of **100** students were assessed in the topics of vectors, ratios and trigonometry. **4** students failed all the three test items, **6** passed vectors only. **10** passed ratios only. **8** passed vectors and trigonometry only. Those who passed ratios and trigonometry only were **30. 10** passed all the three test items.

Those who passed vectors and ratios only were three times those who passed trigonometry only.

Task:

(a) Help the teacher to determine the number of students who passed;

(i) trigonometry only.

(ii) each test item. (vectors, ratios and trigonometry)

(b) Give a reason whether the teacher should conduct remedial lessons or not.

ITEM SIX

The head teacher promised to gift all those who won different games with money. Those who won only one of the games were to receive **Ugx 10,000** each. And those who won two games strictly, were to receive **Ugx 20,000** each and those who won in all the three games were to receive **Ugx 30,000** each. Out of the **100** learners who participated in the competitions, **15** won in football, **20** won in netball, **30** won in volleyball. **6** won in volleyball and football, **7** won in netball and volleyball while **8** won in football and netball. Some learners won in all the three games while others won none of the games. Those who won at least one game were **48** in total. Now the headteacher needs to know how many out of the **100** will not receive gift money and the exact amount to organize for prizing those who fall in the categories he mentioned to gift money.

Task:

(a) How many out of the **100** will not receive money from the head teacher?

(b) How much should the headteacher organise for prizing those who fall in the categories he mentioned?

ITEM SEVEN

A famers' cooperative society gave out fertilizers to a sample of maize farmers in the first season. The number of bags of maize harvested in the first season is given below.

20	**40**	**60**	**55**	**36**	**69**	**59**	**78**	**47**	**66**
59	**70**	**53**	**24**	**63**	**50**	**46**	**38**	**68**	**57**
30	**65**	**58**	**61**	**57**	**86**	**77**	**54**	**29**	**88**
62	**44**	**89**	**45**	**87**	**65**	**47**	**49**	**52**	**69**
41	**80**	**37**	**56**	**74**	**27**	**76**	**58**	**79**	**39**

By presenting the data in a frequency distribution table with classes of interval **10** for easy interpretation,

Task:

Help the society to;

(a) Determine the number of bags of maize above which half of the farmers harvested.

(b) Determine the number of farmers whose harvest is **44.5** bags of maize and below.

ITEM EIGHT

Rashid is a builder who has been contracted by his boss to build a house with a balcony at its top. According to the plan, the boss wants that if he sits at the balcony, he views the top of a hotel building, **21.4 ft.** away at an angle of elevation of **25°.** The height of hotel building is **45 ft.** Rashid wants to know the height from the ground at which he should build the balcony to meet his boss' plan.

Rashid is also going to design the compound of the house with a triangular garden that will be surrounded by circular fence. The garden will have two sides measuring **36 m** and **42 m** and the angle between these sides will be **60°**. He wants to know the perimeter of the fence he will use.

Task

(a) Help Rashid to determine the height at which he is to build the balcony.
(b) Draw an accurate diagram to show how the triangular garden will be like.
(c) Determine the perimeter of the fence he will use.

ITEM NINE

Your compound master wants to design a roundabout at the centre of the main school compound. The roundabout will be in a triangular shape. The two sides of the triangular roundabout will measure **5m** and **7m** and the angle between them will be **45°.**

The compound master also intends to put pavers in the region within the triangular roundabout. Each square meter of pavers costs **Shs 25,000.**

Task:

Help the compound master to;
(a) Draw an accurate artistic design for the triangular roundabout.
(b) Identify the type of triangle represented by the triangular roundabout. Give a reason for your answer.
(c) Determine the amount of money needed to buy the Pavers which will be enough for the triangular roundabout formed.

ITEM TEN

Your Aunt is a senior lawyer employed by a certain law firm. She saved her money and used it to buy a car in January 2021 from her friend at **Ugx 12,500,000.** The car depreciated at a rate of **10%** per annum. In January 2024 she went to the bond to sell it and top up the money and buy a brand new car but she didn't know the value of the car at the time.

At the bond a brand new car of her preference goes for twenty five million but the manager told her they have two payment options.

First option: Buy the car by paying cash and receives a discount of **8%** of the cash value.

Second Option: Deposit **60%** of the cash value and later pay five million per month for **3** months.

Task:

Help your Aunt to determine;
(a) The value of her car in January 2024.
(b) The amount she will pay if she buys the car by paying cash.
(c) The saving she would make if she bought the car by paying cash rather than paying in installments.

END