

**Mathematics**  
**Paper 1**  
**11<sup>th</sup> March, 2024**  
**2 hours**

**DEPARTMENTAL QUESTION PAPER**

**SET ONE**

**S.4 MATHEMATICS**

**Paper One**

**2 hours**

**STUDENT'S NAME:** \_\_\_\_\_

**STREAM :** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**THIS PAGE IS FOR EXAMINER'S USE ONLY**

Do not write in the boxes on this page. The examiner will use them to keep a record of your marks.

<b>Qn</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	<b>TOTAL</b>
<b>Marks scored</b>															

**INSTRUCTIONS**

1. Answer all the items in both sections.
2. Each item in section A carries 4 scores and each question in section B carries 15 scores.
3. Pay attention to the number of scores available for each item.
4. Show all the working and explanation on the answer sheets provided.

## SECTION A: (40 SCORES)

1. Opiku and Legu own a rabbit farm, from which they make an average profit of UGX 750,000 monthly. They re-invest three-eighths of the profit and share the rest of the money between themselves. If Opiku receives  $\frac{5}{12}$  of the profits, determine how much Legu receives. (04 scores)
2. Five small containers of capacities: **12, 16, 24, 56** and **72** litres are to be used to fill up a bigger container. What is the capacity of the bigger container which can be filled up by each of the above containers exactly without a remainder when used separately? (04 scores)
3. Without using tables or calculators, evaluate  $\frac{1}{3-\sqrt{5}} + \frac{1}{3+\sqrt{5}}$  (04 scores)
4. A forest ranger sighted fire from the top of a tower 80m high. If the angle of depression of the fire was  $17.5^\circ$  how far was the ranger from the foot of the tower? Give your answer to 3 significant figures. (04 scores)
5. Solve the simultaneous equations;  $x^2 + 3y^2 = 7$  and  $y - x = 3$ . (04 scores)
6. A motorcyclist started a journey from rest and rode for 3 hours at a steady speed of **30km/hr**, then maintained that speed for five hours, and then started decreasing the speed steadily for the next hours to rest. Represent the above information on a speed-time graph and use it to find the:
  - (a) total distance travelled.
  - (b) Average speed for the whole journey. (04 scores)
7. Prestige Margarine is three times as expensive as Blue Band, and the sum of their prices is not less than UGX 5000. Calculate their least possible prices. (04 scores)
8. Pulkol plans to set up a milk storage tank of volume **6,000** litres. How deep should the tank be, if it is three meters long and two meters wide. (04 scores)
9. The masses of babies weighed at **AKEKA Health Centre** on a certain day were recorded as: 2.5kg, 4.6kg, 4.6kg, 3.5kg, 3.9kg, 3.6kg, 3.5kg, mkg, 4.3kg and 2.9kg. given that the total mass was 3.5kg. find the mean weight. (04 scores)
10. A vacist works for 40 hours a week at a supermarket. He is entitled to a weekly salary of **UGX220,000** plus a 3% commission on sales on over UGX 5 million. Assume that he sells enough this week to get the commission. Determine his weekly.
  - (a) Income when the weekly sales are worth UGX 6 million.
  - (b) Sales when the weekly income is **UGX 430,000**. (04 scores)

## SECTION B:(60 SCORES)

11. Mr Lwanga Badru Sheila's father a S.4 South student went to Kampala on Independence day and visited three shops. A clothing Store shop that was offering a general 25% discount on all there stock. However for that independence day only, the store advertised an additional 10% discount to celebrate with the Ugandans independence day. The price tag on Sheila's sweater was marked UGX60,000. He then proceeded to SG furniture dealers and found this information on the show room entrance.

### "BEST TERMS ON SOFA SETS"

**CASH PRICE:** UGX 4,200,000 with a 10% DISCOUNT

**HIRE PURCHASE:** DEPOSIT UGX 1,200,000 AND PAY 8 EAQUAL MONTHLY INSTALLMENTS OF UGX431,250

Mr. Lwanga could not pay cash and opted for hire purchase. He then proceeded to his Saving scheme which gave him a top up loan of **UGX3,000,000** at a compound interest rate of **4.8%** per annum. If he was to pay back the loan in a period of 24 months.

#### Tasks:

- (a) What was the sale price of sweater.
  - (b) Find the extra amount of money he paid to the furniture dealer because he did not pay cash.
  - (c) How much interest did the **SACCO** earn from Mr Lwanga. *(15 scores)*
12. A village has **160** homes. **74** of the homes grow groundnuts, 82 of them grow maize, and 63 of them grow sorghum. No home grows only sorghum. 64 homes do not have any garden. 60 homes grow groundnuts and maize, while 45 homes grow sorghum and groundnuts. The number of homes that grow groundnuts only is one more than that of the homes that grow maize only.
- Task: Using a Venn diagram find.
- (a) The number of homes that grow all the three types of crops.
  - (b) The probability that a home visited at random in that village grows at least two types of crops. *(15 scores)*
13. A company was contracted to transport 1200 tonnes of sand. The company used type A and type B trucks to do the job. Each type A truck carries 10 tonnes of sand per trip while each type B truck carries 15 tonnes per trip. The total number

of trips must not be less than 70 and type B trucks must make at least twice as many trips as type A trucks while the latter i.e. type A, must not make less than 10 trips. Taking  $x$  to represent the number of trips made by type A trucks and  $y$  to represent the number of trips made by type B trucks,

(a) write down all the inequalities representing the above information.

(b) Represent the inequalities in (a) graphically.

The company makes a profit of Shs 2000 per trip made by each type A truck and Shs 3000 per trip made by each type B truck.

(c) (i) Write down the objective function for profit.

(ii) Determine the number of trips, each type of truck must make to maximize the profit.

(iii) Hence calculate the maximum profit. (15 scores)

**14. In MAXWEL STATIONERY SHOP**, the manager gets the monthly allowances as follows.

Medical Shs 480,000 per annum

Transport Shs 50, 000

Housing Shs 10% of the gross monthly income

Marriage Shs  $\frac{1}{80}$  of the gross annual income.

Lunch Shs 7,500 per week.

Family allowance for four children using following system

12 years and below Shs 3000

Above 12 years but below 18 years Shs 2000

Okurut earns a gross annual income of shs 9,180,000 and his children are aged 5, 9, 15, 17 and 22. His tax structure is given below.

Taxable Income (shs)	Rate %
0 – 130, 000	5.0
130, 001 – 260, 000	10.0
260,001 – 360, 000	15.0
360,001 – 400, 000	20.5
Above 400, 000	30.0

(a) Calculate Okurut's

(i) Monthly taxable income

(ii) Monthly income tax

(b) Express the net income paid as a percentage of his gross monthly income.

(Correct your answer to 1 d.p) (15 scores)

**END**