**LEGACY SECONDARY SCHOOL - KIWAWU**

**END OF TERM II EXAMINATION 2024**

**FORM THREE**

**Time:**

**Instructions:**

* Attempt any four items.
* All items carry equal scores.

**ITEM I**

A certain tourist in USA is planning to visit the following places in Africa next month. The tourist has highlighted the following places on the map of Africa. These include South Africa, Burundi, Kampala, Dodoma, Accra, Bujumbura, Nairobi, Ghana, Johannesburg, Tanzania, Uganda, Kenya, Cairo, Kigali, Egypt and Rwanda. Mr. Apeku Elias is an agent for three companies of soda: Coca cola, Pepsi and Riham beverages. He earns 10% commission on every carton of soda sold. He sells each carton of coca cola at Ugx. 11, 000/=, a carton of pepsi at Ugx. 11,000 and Riham at Ugx. 10,000. On a good day, he sells 30 cartons of coca cola, 20 cartons of Pepsi and 10 cartons of Riham.

**Tasks:**

1. Help the tourist to sort the places by use of an arrow diagram.
2. i) List the places in the Domain set.

ii) List the members of the range.

iii) What is the relationship between the domain and range?

iv) Describe the type of mapping in the arrow diagram in (a) above.

1. Help Apeku to know the commission earned on a good day from all the sales.

**ITEM II**

A certain member of your family re-wrote each digit of his 4-digit ATM card pin from decimal system to another number less than four. He did this in fear of theft. Now he is sick in Mulago National referral hospital, he can neither talk nor write but the money on his account is needed to finance hospital bills. Here is how he wrote the pin: 21 20 22 10. Assuming that you have been able to encrypt the ATM pin for the family and funds are available to take care of him. The hospital has a nurse who checks on him after every two and half hours and a medical doctor who checks on him after every four hours. Both medical personnel last checked on him together at 9:30 am. He was treated well and discharged and advised as follows. He was advised to spend three-eighths of the day resting, one sixth of the day eating, one thirds of the remainder having a balanced diet and the rest of time of the day visiting the hospital for further checkup.

**Tasks:**

1. i) Which number system do you think he used to rewrite the pin and why?

ii) Use the identified number system to help your family members to regenerate the original pin.

1. i) At what time will both the nurse and medical doctor check on him at the same time.

ii) How many hours of the day in a week does he have to spend on visiting the hospital.

**ITEM III**

The school head teacher Legacy SS is thinking of how he can boost the mathematics department of his school. He can either add another teacher or buy more books or both. He has decided that he will do both if the average performance for this year’s performance for 50 students is lower than that of the previous which was 64. He asked the department to give a test and these were the student’s marks.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 86 | 30 | 26 | 64 | 87 | 47 | 49 | 26 | 43 | 25 |
| 45 | 38 | 44 | 56 | 59 | 52 | 52 | 27 | 89 | 46 |
| 90 | 57 | 73 | 48 | 58 | 89 | 89 | 32 | 56 | 88 |
| 66 | 62 | 52 | 67 | 69 | 68 | 49 | 92 | 66 | 95 |
| 54 | 74 | 32 | 39 | 35 | 36 | 69 | 50 | 71 | 92 |

He also visited the library and found out that the previous candidates used three books for their revision. Longhorn, Baroque and New vision. From the Liberians records, it’s clear that all the candidates that did not use any book failed the subject greatly. Out of the 35 candidates this year, 13 used Longhorn, 20 used Baroque and 17 used New Vision. 9 used Longhorn and New vision, 3 used Longhorn and Baroque while 8 used Baroque and New vision only. The records show that 2 used all the three books. He observed that he should replace one book type of the three with Fountain publisher since no student read it only alone.

**Task:**

1. i) Help the head teacher to group the marks to make an informed decision on the fate of the department and defend it.

ii) Display the students’ marks in groups on a simple statistical diagram.

1. i) Help the head teacher identify the book he should replace and explain why?

ii) Find the probability that a student selected from the class failed.

**ITEM IV:**

A certain catering and decoration company was called to cook **100Kg** of rice at a certain party. According to their cooking notes, they put **22.5 liters** of water in **10kg** of rice and **67.5 liters** of water in **30kg** of rice. They want to use those notes to know how many liters to use in the rice they are ordered to cook but they are finding it hard.

On that day of party the traffic police arrested all motorists travelling along Kampala-Jinja highway with a speed greater than A motorists travelled the first **90km** at an average speed of and for the next hours, he travelled at an average speed of . On a certain day a car travelling at km/hr can be stopped within a distance meters, where

The table below gives some values of d against s

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|  | 0 | …… | ……. | 7.5 | ……. | …….. | …….. | 31.5 | …….. | ……. | 60 |

**TASKS:**

1. i) Form a mathematical relationship between the quantity of rice and liters of water used to cook it according to their notes.

ii) Use the relationship developed to help to help them determine the liters they will use in the rice they are ordered to cook.

1. Find out if the motorist will be stopped and arrested and at what interval of distance ()

**ITEM V:**

Three schools from Gayaza region want to participate in the National Football Sports Gala to be held in Lyantonde district playground. Unfortunately none of the schools has a school bus and they want to hire a bus for one day activity. The bus charges **25,000/= per kilometer** moved. The three schools through their sports master agreed to share the cost of the bus equally amongst them. On that day, they hired a bus from your school in Gayaza and they set off at **4:30am** and increased speed gradually to **90Km/hr** reaching Mpigi at **6:45am.** From there, the bus driver maintained this same speed for hours up to Masaka. From Masaka, he reduced slowly in speed reaching Lyantonde at **9:30am.** The games started at **10:00am** prompt and each team played six games.

**School A: Won 3 games, drew 2 games and lost 1 game.**

**School B: Won 4 games and lost 2 games.**

**School C: Won 2 games and drew 4 games.**

The organizers award three points for a win, one point for a draw and no point for a loss. They declared these schools the first three schools in order of their points they obtained from the games. They were to receive the price money of sixteen millions five hundred thousand shillings.

**Tasks:**

1. Find out how much each school paid for the bus.
2. Decide the cash price for the three schools.

**ITEM VI:**

Pamungu bought a car in January 2017 from his friend at shs.12, 500,000. If the car depreciates at a rate of 10% per annum. Calculate the value of Pamungu’s car by January 2020. A Ugandan tourist left Germany for Uganda through Switzerland. While in Switzerland he bought a watch worth 100 Deutsche Marks (Germany currency). 1 Swiss Franc =1.28 Deutsche Marks, 1 Swiss Franc= 1,350 Ugandan shillings.

A secondary school teacher as a requirement by the government pays tax every month according to the tax structure below.

|  |  |
| --- | --- |
| **Income (shs) per month** | **Tax rate (%)** |
| 01 – 50,000 | 5% |
| 500,001 – 100,000 | 9.5% |
| 100,001 – 180,000 | 15% |
| 180,001 – 300,000 | 18% |
| 300,001 – 400,000 | 23% |
| 400,001 – 500,000 | 30% |
| Above – 500,000 | 35% |

The teacher earns shs. 760,000 and his allowances include.

Marriage allowance - shs. 50,000 per month.

Water and electricity - shs. 60,000 per month

Housing allowance - shs. 150,000 per month

Medical allowance - shs. 300,000 per annum.

Transport allowance - shs. 3,000 per day

Paying an insurance and relief - shs. 180,000 per annum.

Family allowance for only three children. For children in the age bracket 0 to 10 years,shs12,000 per child, between 10-15 years shs. 9000 per child. 15 years and above shs 5000.

Given that the employee has five children, two of whom are aged between 0 and 10, the other two are aged 10 and 15 while the other 18 years. (A month has 30 days)

1. Find the value of the watch in;
2. Swiss Francs.
3. Ugandan shillings.
4. Determine the teacher’s net income.
5. Determine the percentage of his gross income that goes to tax.

**THE END**