JINJA MODERN VOCATIONAL AND SECONDARY SCHOOL

Senior Five End of Term One Mathematics Paper 2 2026

2 HOURS and 15 MINUTES

Instructions

- *This paper consists of two (2) sections; A and B with a total of four examination items.*
- *Section A is compulsory, Attempt any one item in section B.*
- *All in all, a total of 3 items should be attempted. Any additional item(s) attempted will not be given any score(s).*
- *Begin each item on a fresh page and clearly number them as they appear in the examinations paper.*
- *Silent, non-programmable calculators and mathematical tables are allowed. Where necessary, graph paper is provided.*
- *Tidy handwriting, clear presentation of work and meaningful mathematical judgements or conclusions will increase your chances of excelling*

SECTION A

Item 1

A supermarket in Kampala records the number ***X*** of the meat pies sold per day over several weeks. Their probability distribution is given by

Number of meat pies (x)	10	20	30	40	50
$P(X=x)$	k	$2.5k$	$3.5k$	$1.5k$	$1.5k$

Each meat pie which is sold at sh 6000 costs sh 1500 to make it. If ***Y*** is the possible profit each day, help the manager to:

a) Determine the
   i) value of k
   ii) expected number of pies sold per day;
   iii) variance of the distribution;
   iv) cumulative distribution F(x) and sketch it.

b) Construct the probability distribution of the daily profit made. Hence determine the average daily profit made.

Item 2

A cooperative society of farmers in Luwero recorded the cassava yield (in tonnes per hectare) from 50 small plots. The data is grouped as follows:

Yield (Tonnes per Hectare)	**Number of plots (Frequency)**
5 - < 10	6
10 - < 15	10
15 - < 20	15
20 - < 25	11
25 - < 35	8

Tasks:

a) Construct a histogram to represent this data.
b) Using the histogram, estimate the modal yield of cassava per hectare.
c) Calculate an estimate of the mean yield and the standard deviation of the yield for these plots.

SECTION B

Item 3

At a construction site in a school, a team of workers is testing rope tensions on a triangular metal frame labelled **PQR**. Sarah, the site engineer, explains to her assistant David and trainee Musa that forces act along the edges of the triangular frame due to weights attached at different points. He notes that:

- A 5 N force acts along side PQ.
- A 10 N force acts along side QR.
- An 8 N force acts along side PR.

David wants to know the magnitude of the single resultant force acting on the frame so that the structure remains in equilibrium.

Hint: Triangle **PQR** is equilateral, so all sides are equal and all internal angles are 60°.

Task

a) Draw a diagram of triangle **PQR** with the forces labelled along the sides.
b) Find out the magnitude of the resultant force acting on the triangle.
c) Give one example of a situation in engineering, construction, or daily life where calculating the resultant of forces acting at angles is important. Explain why knowing the resultant is necessary.

Item 4

A heavy rectangular frame ***ABCD*** of mass 120 kg is such that ***AB*** = 8 cm, ***BC*** = 6 cm. The forces of magnitudes 7 N, 1 N, 13 N, 5 N, 20 N and 30 N act along the lines ***AB***, ***BC***, ***CD***, ***DA***, ***AC*** and ***BD*** respectively, in the directions given by the order of the letters. Take ***AB*** and ***AD*** as the x-axis and y-axis respectively. Sarah wishes to know whether the frame will move and the direction in which it will move.

Help Sarah to:

a) write each of the forces in vector form;
b) determine the magnitude and direction of the resultant force;
c) determine the magnitude of the rate at which the frame will accelerate under the action of these forces.

END