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MATHEMATICS

Paper 1

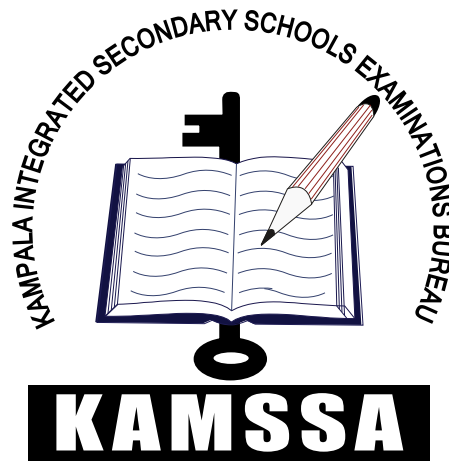
July - August 2024

2 ¼ hours

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KAMSSA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consists of **two** sections; **A** and **B**. It has **six** examination items.*
- *Section **A** has **two** compulsory items.*
- *Section **B** has **two** parts; **I** and **II**. Answer **one** item from each part.*
- *Answer **four** examination items in all.*
- *Any additional item(s) answered will not be scored.*
- ***All** answers must be written in the Answer booklet(s) provided.*
- *Graph Paper is provided.*
- ***Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.***

SECTION A (COMPULSORY)

Answer all items in this section.

ITEM 1

A number of nurses working in Nairobi referral hospital decided to raise Kshs 144,000 to buy a plot of land in Kenya in order to put up their private health clinic. Each nurse was to contribute the same amount. But unfortunately, before the contribution were collected, five of the nurses retired. This meant that the remaining contributors had to pay more to meet the target and each nurse had to add Kshs 2400 on contribution to bridge the gap of those who retired.

Task

- Find the number of nurses originally at Nairobi referral hospital and how much would each nurse have contributed to nearest shilling if the 5 nurses had not retired.
- Determine the percentage increases in the contribution per nurse because of the retirement.

ITEM 2

You have been hired as a managing director of the theatre LA Bonita and on your first day in the office, you are given the performance records of the theatre. In the records you find out that the theatre has a sitting capacity of 250 people and the charges are 100 dollars for ordinary seats and 160 dollars for a special seat. You also found out that it costs 16000 dollars to stage a show and you are told to make sure the theatre must make a profit in the coming show.

You also found out that there are never more than 200 ordinary seats and for a show to take place at least 50 ordinary chairs must be occupied and the number of special seats is always less than twice the number of ordinary seats.

Task

Help the chairperson and financial director of theatre labonita to determine the number of seats of each type that should be booked in order to maximize the profit before the next show day comes.

SECTION B

This section has two parts I and II

Part I

Answer one item from this part.

ITEM 3

A mathematics teacher in a certain school in Uganda found out that S.4 students in his school were taking too long to answer statistics and probability questions in every mathematics examination. He asked students to form a two-digit number from the first four prime numbers in the first five minutes and then asked them to answer a statistics question and he recorded how long it took each student.

Below is the time in minutes the teacher recorded.

35	31	32	39	35	26	31	32	29	35	31
32	39	34	29	39	27	39	39	26	29	39
34	32	35	39	32	32	26	36	35	34	

- If each number formed from the first four prime numbers can be used only once, calculate the probability that a number chosen from the digit number is an even number.

- b) Determine whether the learners took longer or shorter time to answer the statistic question.
- c) The statistics question is worth 15% of the total marks in a three-hour mathematics paper
- How long should each student spend on this statistics question.
 - What is the percentage of students who were spending too long on the statistics question.
 - How many students spend the longest and shortest time.
- d) Represent the information on a statistical graph and use it to obtain the inter-quartile range.

ITEM 4

Mrs. Maria was an enumerator in the recently concluded population census in Mwajija village Buikwe district. She revealed out that this village has 100 men of which some were literate married or had an income generating project. She finds out that 47 men were literate, 59 men were married and 52 had income generating projects. However, she also found out that 30 men were both married and literate, 24 were literate and had some income generating project though also 34 who were married also had income generating project. However according to her records, she also revealed out that 14 of the men were literate, un married and without any income generating project. After the enumeration exercise Mrs. Maria bought 5kg of sugar and 7kg of rice to take back home at Shs 11800, her colleague Livingstone also bought a take back home of 6kg of sugar and 8kg of Rice at Shs 14000.

Task

- Help Mrs. Maria to determine the number of men who were.
 - Literate married and had an income generating power.
 - The probability that a man chosen at random was neither literate nor married.
- Whom do you think spent the biggest amount on take back home and by how much?

Part 2

Answer one item from this section.

ITEM 5

A ship leaves Mwanza port and sails on a bearing of 050° heading towards port bell. Two terrorist groups ADF and Al-Shabab sail from port Kisumu to intercept the ship. ADF terrorist group sails such that it covers the shortest distance possible.

Al-Shabab group sails on a bearing of 020° to port bell at a speed of 25km/hr. The bearing of Kisumu port from Mwanza port is 100° and the distance between these two ports is 300km. The UPDF was alerted in time and hid at port bell in a rectangular block building which had length of 2cm more than the width and with a height of 1cm more than two times the width and have a volume of 624cm^3 .

Task

- Determine the position of the three ports and hence describe the direction of Kisumu port from port bell.
- For how long would the UPDF had to wait and ambush the Al-Shabab group at port bell.

With clear evidence based on mathematical calculation, what do you think was the total surface area of the rectangular block building?

ITEM 6

Ismail as an interior designer, has a project which includes installing five lamps on the ceiling of a sitting room.

He understands co-ordinates and on his plan his positions of the lamps are A (8,11) B (5,-5), C(23,-9) D(17,11) and P(11,3) where each co-ordinate value is in meters.

Ismail claims that the lamps B, P and D are in a straight line. With the reason prove him right or wrong. In the next dining room, he needs to use the same design but with lamp positions rotated through a positive quarter turn about the origin. Help him acquire the coordinates on the positions in the dining room.

He also wanted to depend on D and enlarge compositions A, P, and D using scale factor of $\frac{-1}{2}$ in the order come up with a design in the kitchen room which was just near the dining, help him to come up with the positions of the lamps in the kitchen room after this enlargement.

END