**ST. JOSEPH OF NAZARETH HIGH SCHOOL**

**UGANDA ADVANCED CERTIFICATE OF EDUCATION**

**INTERNAL MOCK EXAMINATION 2017**

**SUBSIDIARY MATHEMATICS S475/1**

**PAPER 1**

**TIME: 2HOURS 40 MINUTES**

**INSTRUCTIONS TO CANDIDATES:**

* Answer **all** the **eight** questions in section **A** and any **four** questions from section **B**.
* Any additional question (s) answered will not be marked.
* Each question in Section **A** carries **5** marks while each question in Section **B** carries **15** marks.
* All working must be shown clearly.
* Begin each answer on a fresh page.
* Graph paper is provided.
* Silent non – programmable scientific calculators and mathematical tables with a list of formulae may be used.
* Take **g = 9.8 ms-2**

**SECTION A (40 MARKS)**

Answer **all** the questions in this Section.

1. Express in form of and state the value of (05 marks)
2. Find the number of even numbers containing one or more digits that can be formed from digits; 2,3,4,5 and 6 if no digit is repeated. (05 marks)
3. If the roots of the equation are and ; find the quadratic equation whose roots are and (05 marks)
4. The table below shows the cost per kg of some items commonly used by a certain family.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | Bread | Rice | Beans | Millet | Salt |
| **Cost per kg** | 2500 | 2800 | 2000 | 3000 | 500 |

Using the price of **beans** as the **base price**, calculate the **cost of living**

index and comment on your results. (05 marks)

1. When the polynomial is divided by the remainder is and when divided by the remainderis . Find the values of and **b**. (05 marks)
2. The yields per hectare of maize and the rains received on various farms in a district are given in the table below.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Farms** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
| **Rain (in mm)(x)** | 1050 | 642 | 1033 | 1139 | 570 | 873 | 1066 | 1250 |
| **Yield per hectare (in thousand kg’s)(y)** | 7.6 | 4.5 | 5.5 | 4.0 | 5.2 | 6.0 | 7.1 | 5.9 |

1. Calculate the rank correlation coefficient between and .
2. Comment on the results

(05 marks)

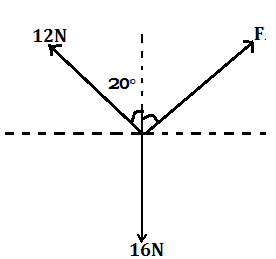
1. Given that vectors; and Find the angle between vector and vector . (05 marks)
2. Two particles of masses and are connected by a light inextensible string passing over a smooth pulley. Find the common acceleration and tension in the string. (05 marks)

**SECTION B (60 MARKS)**

1. (a) The diagram below shows three forces; and acting on a

particle. If the forces are in equilibrium; find the values of;

1. Force
2. angle



(07 marks)

(b) In a rectangle and . Forces of magnitudes;

and act in the directions of the letters;

and respectively. Taking as the horizontal; find the magnitude and

direction of the resultant force. (08 marks)

1. (a) Given that
2. Show that
3. Determine the possible values of in (i) above between and if

(06 marks)

(b) Solve the equation for (06 marks)

(c) Without using tables or calculator show that;(03 marks)

1. A continuous random variable x has a probability density function given as;

Find the;

1. Value of (05 marks)
2. Median of (05 marks)
3. (05 marks)
4. The gradient of a curve at point is If point lies on the curve. (05 marks)
5. Find the equation of the curve. (04 marks)
6. Determine the coordinates and nature of its turning points hence sketch

the curve. (07 marks)

1. Find the area enclosed by the curve and the (04 marks)
2. A salt factory sells salt in bags of mean weight and variance . Given that the weights of the bags are normally distributed; find the;
3. Probability that the weight of any bag selected at random lies between and g. (04 marks)
4. Percentage of bags whose weights;
5. exceeds
6. lies between and .

(07 marks)

1. Calculate the number of bags that will be rejected out of purchased for weighing below . (04 marks)
2. The weights of fish in kg trapped in river Limpopo are given below;

5.1 4.7 6.2 4.4 6.5 4.1 6.4 5.7 11.2 6.5

6.1 4.8 9.2 5.9 8.1 5.1 4.9 7.9 8.4 1.1

7.1 5.1 6.3 7.8 7.2 0.5 8.3 5.1 3.6 8.9

6.6 4.2 12.1 8.1 10.2 9.1 6.5 8.3 9.0 9.2

8.4 7.3 7.5 6.1 4.9 8.0 7.8 5.8 4.3 2.8

1. Make a grouped frequency distribution table of these weights starting with a class of
2. State the;
3. Class interval
4. Modal class
5. Calculate the mean weight
6. Draw an give and use it to estimate the;
7. percentile
8. quartile deviation

(15 marks)

**~END~**

**SUCCESS IS A STRUGGLE!**

