**S475/1  
S.6 SUB – MATHEMATICS  
Paper 1  
July, 2019  
2 2/3 hours**

**Uganda Advanced Certificate of Education  
INTERNAL MOCK EXAMINATIONS 2019  
SUB – MATHEMATICS   
Paper 1  
2 hours 40 minutes**

**INSTRUCTIONS**

* *Answer* **all** *the eight questions in section* **A** *and any* **four** *questions in section* **B.**
* *Any additional question(s) answered will* **not** *be marked.*
* *Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*
* *Where necessary, take acceleration due to gravity, .*

**SECTION A (30 MARKS)**

1. Express without a surd in its denominator. (05 marks)
2. A green, Red and three yellow balls are to be arranged in a row. What is the probability of having a red ball net to a green ball. (05 marks)
3. Solve the differential equation given that when (05 marks)
4. The data below shows the temperature in degrees in a certain city at midday during the first week of May 12, 16, 14, 11, 12, 15, 13. Calculate the 3 point moving averages for the data. (05 marks)
5. Given that and are roots of the equation Form an equation whose roots are (05 marks)
6. A continuous random, variable X has a probability distribution below;

0 ; otherwise

Find;

(a) Value of constant ,

(b) (05 marks)

1. Given that and . Find the value of

(a)

(b) order of matrix T if T (05 marks)

1. PQRS is a square, forces of 3N, 5N, 6N, and N act along PQ, QR, RS, and PR respectively.

R

6N

S

5N

Q

3N

P

Calculate the resultant force of the system (05 marks)

**SECTION B**

1. The table below shows the prices and quantities of building materials between 2014 and 2015.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM | **PRICES IN UG SHS** | | **QUANTITIES** | |
| **2014** | **2015** | **2014** | **2015** |
| Iron sheets  Cemment  Sand  Tiles  Nails | 45,000  28,000  140,000  30,000  3,500 | 55,000  35,000  105,000  37,000  4,800 | 8  12  10  4  22 | 5  18  10  3  15 |

Taking 2014 as the base year, Calculate

1. Price relative for each item. (05 marks)
2. Simple average index for 2015 (04 marks)
3. Weighted aggregate price index for 2015 and hence comment on your result. (06 marks)
4. (a) Solve for for (07 marks)

(b) If sin and A is obtuse, and and B is acute. Find without using tables or calculator,

(i) (04 marks)

(ii) (04 marks)

1. (a) Events A and B are independent such and . Find the probability that

(i) both A and B occur (03 marks)

(ii) only one of the events occur (04 marks)

(b) A random variable X has a probability distribution function given below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | 0 | 1 | 2 |
|  | 0.1 | 0.3 | 0.4 | 0.2 |

(a) Calculate;

(i) the mean mark (03 marks) (ii) the standard deviation (04 marks)

1. (a) Find and determine the nature of the turning point of the curve .   
    Hence sketch the curve. (10 marks)

(b) Calculate the area bounded by the curve and line (05 marks)

1. The table below shows the marks scored by 50 students in a class.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Marks |  |  |  |  |  |  |
| Number of students | 3 | 11 | 29 | 40 | 47 | 50 |

(a) Calculate;

(i) the mean mark (03 marks)

(ii) the standard deviation (04 marks)

(b) Display the data on an ogive and use it to estimate the:-

(i) median mark (02 marks)

(ii) range of middle 50 percentile mark. (03 marks)

1. Body of mass 8kg rests on a rough horizontal table and is connected to another body of mass 3kg by a light inextensible string passing over a smooth pulley fixed at the edge of the table. The 3kg mass hangs freely. The coefficient of friction between the 8kg mass and the table is 0.3. The system is released from rest. Find the

(i) acceleration of the system. (05 marks)

(ii) tension in the string (05 marks)

(iii) distance the 3 kg mass covers after 2 seconds. (05 marks)

**END**