**S475/1**

**Subsidiary**

**Mathematics**

**Paper 1**

**Nov, 2020**

**2 2/3 hours**

**ST. MARYS’ KITENDE**

***Uganda Advanced Certificate of Education***

**RESOURCEFUL MOCK EXAMINATION 2020**

**SUBSIDIARY MATHEMATICS**

**Paper 1**

***TIME: 2 HOURS 40 MINUTES***

**Instructions:**

* *Attempt* ***all*** *questions in section A and any* ***four*** *from section B.*
* *All working must be shown clearly.*
* *No papers should be given for rough work.*
* *Squared papers and Mathematical tables are provided.*
* *Silent, non-programmable scientific calculators may be used.*
* *Where necessary, use g=9.8ms-2.*

**SECTION A (40MARKS)**

*Attempt* ***all*** *questions in this Section.*

1. Without using a calculator, evaluate; . (5marks)

2. An electronics shop has types A and B television sets. The chances of selling type A and B are 0.64 and 0.36 respectively. Given that televisions are sold independently, find the probability of selling;

i) atleast one type

ii) only one type (5marks)

3. The table below shows the unit prices in shillings of three commodities in 2015 and 2016 together with their values.

|  |  |  |  |
| --- | --- | --- | --- |
| Commodity | Price in 2015 | Price in 2016 | Value |
| Matooke | 12,000 | 18,000 | 2 |
| Beans | 1,500 | 1,950 | 2 |
| Sugar | 3,000 | 3,600 | 1 |

Using 2015 as the base year, calculate the value index.

4. Determine the numbers of ways in which letters in the word SWEET can be arranged when S and T are not together. (5marks)

5. The position vectors of points and are and respectively. Determine angle .

6. A continuous random variable x has probability density function defined by;

;

;

Determine the;

1. value of
2. (5marks)

7. Given that and , use matrix method to solve the equation and find matrix . (5marks)

8. A lorry of mass 200kg travels against friction resistance of 2600N for 50m along a level road at a constant speed of 45kmh-1. Calculate the;

i) work done by the engine

ii) power at which the engine is working. (5marks)

**SECTION B (60MARKS)**

*Attempt any* ***four(4)*** *questions.*

9. The weekly sales of bags of cement recorded by a hard ware shop for months of January to March were as shown;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Month** | **Week** | | | |
| 1 | 2 | 3 | 4 |
| January | 422 | 497 | 325 | 260 |
| February | 408 | 475 | 314 | 244 |
| March | 381 | 428 | 291 | 222 |

a) Use the data to calculate a four weekly moving totals and hence or otherwise the four point moving averages.

b) On the same axes, draw the original data and the moving averages. Comment on your results

c) Use your graph in (b) above to find the number of bags that were sold in the first week of April. (15marks)

10. A curve has one turning point and two points A and B where it meets the x-axis.

a) Determine the;

i) Co-ordinates and nature of the turning point.

ii) Co-ordinates of A and B and hence sketch the curve.

b) Find the area enclosed between the curve and the x-axis. (15marks)

11. a) Solve the equation (8marks)

b) Prove that hence determine the solution in the range of the equation . (7marks)

12. A wound heals so that the rate of decrease of its area is per day where is the time (in days) since the wound was inflicted. Given that the wound had an initial area of .

a) Find an expression for in terms of .

b) Determine how long the wound took to;

i) Reduce to

ii) Heal completely (15marks)

13. The points scored by eight universities in high (x) and long jump (y) were recorded as shown in the table below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Universities | A | B | C | D | E | F | G | H |
| High jump (x) | 50 | 54 | 40 | 100 | 22 | 54 | 54 | 100 |
| Long jump (y) | 136 | 130 | 140 | 121 | 150 | 132 | 130 | 120 |

a) Draw a scatter diagram and use it to;

i) Compare the universities performance in the competitions

ii) Determine the score in long jump for a university which scored 18 points in high jump. (8marks)

b) Calculate a rank correlation coefficient and comment on your results.

(7marks)

14. The table below shows the marks scored in a test by 50 pupils drawn at random from a large class.

|  |  |
| --- | --- |
| **Marks** | **Number of pupils** |
| 0 - <10 | 8 |
| 10 - < 20 | 11 |
| 20 - < 40 | 17 |
| 40 - < 50 | 7 |
| 50 - < 60 | 4 |
| 60 - < 80 | 3 |

a) Calculate the estimates of the mean and standard deviation of the sample.

b) Given that the marks scored by pupils were normally distributed, determine the probability that a pupil chosen at random from the class scored between 38 and 43 marks. (15marks)

***END***