**S475/1**

**Subsidiary**

**Mathematics**

**Paper 1**

**2hrs:40Min**

**UACE REGISTRATION EXAMINATIONS**

**SUBSIDIARY MATHEMATICS**

**PAPER 1**

**TIME: 2HOURS 40MINUTES**

**Instructions**

*Answer all the eight question in Section A and only four questions in Section B*

*All working must be shown clearly*

*No paper should be given for rough work*

*Squared paper and mathematical tables are provided*

*Silent non-prgrammable scientific calculators may be used.*

*Where necessary us g = 9.8ms-2.*

**SECTION A (40MARKS)**

1. Evaluate; . (5marks)
2. In an arithmetic progression (AP) of 21 terms, the 21st Term is 252. Find the sum of the first 16 terms if the first term is 192. (5marks)
3. The matrix and I is a identity marix. Determine the matrix B such that . (5marks)
4. Solve the equation for values of . (5marks)
5. The table below shows a r.v.x with the following probability distribution.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 |
|  | k | 5k | 2k | k | 3k | k |

Find the;

1. Value of k (2marks)
2. (2marks)
3. (1marks)
4. Three events A, B and C are such that and . Find
5. (2marks) (3marks)
6. The table below shows the ranks of marks awarded by judge 1 and Judge 2 to 7 choir groups A to G.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Choir | A | B | C | D | E | F | G |
| Rank Judge 1 | 2 | 4 | 6 | 1 | 5 | 3 | 7 |
| Rank Judge 2 | 2 | 3 | 5 | 1 | 6 | 4 | 7 |

Calculate Spearman’s rank correlation coefficient between the marks awarded by the two judges. Comment on your result. (5marks)

1. A bullet of mass 50g is fired towards a stationary wooden block and enters the block when travelling horizontally with a speed of 500ms-1. The wooden block provides a constant resistance of 36000N. Find how far into the block the bullet will penetrate. (5marks)

**SECTION B (60MARKS)**

Answer only **4** questions from this section.

1. a) Find the equation of the tangent to the curve at the point (5marks)

b) The equation of a curve is given by , Find;

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

ii) and intercepts

1. Sketch the curve. (10marks)
2. The roots of the equation are and . Determine the;
3. Values of and . (12marks)
4. Quadratic equation with integral coefficient whose roots are and . (3marks)
5. The table below shows the number of students and the marks scored in a test.

|  |  |
| --- | --- |
| **Marks** | **Number of Students** |
| 0 – 4  5 – 9  10 – 14  15 – 19  20 – 24  25 – 29  30 – 34  35 – 39 | 10  7  5  3  7  11  37  20 |

1. i) Draw a cumulative frequency curve (Ogive) for the data.

ii) Use the ogive to estimate the medium mark. (6marks)

1. Calculate the
2. Mean mark
3. Standard deviation (9marks)
4. The table below shows the prices (in Ug Shs) of some food items in January, June and December together with the corresponding weights.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **Price(in Ug Shs)** | | | **Weight** |
|  | **January** | **June** | **December** |
| Matooke  (1 bunch) | 15,000 | 13,000 | 18,000 | 4 |
| Meat 91kg) | 6,500 | 6,000 | 7,150 | 1 |
| Posho (1kg) | 2,000 | 1,800 | 1,600 | 3 |
| Beans (1kg) | 2,200 | 2,000 | 2,860 | 2 |

Taking January as the base month, calculate the;

1. Simple aggregate price index for June

Comment on your results. (5marks)

b) Weighted aggregate price index for December.

Comment on your results (10marks)

13. A continuous random variable X has a probability density function given by;

, 1

, *otherwise*

Where k is a constant

1. Find;

i) the value of k (4marks)

ii) (4marks)

iii) the mean of (3marks)

1. Sketch the graph of (4marks)

14. A motorist moving at 90kmh-1 decelerates uniformly to a velocity Vms-1 in 10 seconds. He maintains this speed for 30 seconds and then decelerates uniformly to rest in 20 seconds.

a) Sketch a velocity time graph for the motion of the motorist. (6marks)

b) Given that the total distance travelled is 800m, use your graph to calculate the value of V. (5marks)

c) Determine the two decelerations. (4marks)

***\*\*END \*\****