**P425/2**

**APPLIED**

**MATHEMATICS**

**PAPER 2**

**3 HOURS**

**KIGEZI HIGH SCHOOL**

**S.5 MID TERM EXAMINATIONS**

**APPLIED MATHEMATICS**

**PAPER 2**

**3 HOURS**

**INSTRUCTIONS TO CANDIDATES**

* *Answer* ***all*** *the* ***eight*** *questions in Section* ***A*** *and any* ***Five*** *from Section* ***B.***
* *All necessary working* ***must*** *be shown clearly.*
* *In numerical work****,*** *take* ***g*** *to be *
* *Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*

**SECTION A: (40 MARKS)**

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

1. Cartons of orange juice are advertised as containing 1 litre. A random sample of 100 cartons give the following results for the volume, x. and Calculate the mean and standard deviation of the volume of orange in these 100 cartons (**05 marks)**

2. ABCD is a square, Forces of magnitude 9N, 5N and3 act along and BD respectively. Find the resultant force. **(05 marks)**

3. Use the trapezium rule with 6 ordinates to estimate correct to 4 decimal places. **(05 marks)**

4. Events A and B are such that and Determine

(i) The value of x **(03 marks)**

(ii) P (A or B but not both A and B) **(02 marks)**

5. A ball projected from level ground with a speed of at an elevation of 45° passes just above the top of two vertical posts each of height 30m. Find the distance between these posts. Take g as **(05 marks)**

6. The resistance of a wire at different temperatures is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| Resistance ( Ω ) | 6.6 | 2.9 | -0.1 |
| Temperature (°C ) | 0 | 12 | 20 |

Use linear interpolation or extrapolation to estimate the:

(i) Temperature corresponding to -1 Ω.

(ii) Resistance corresponding to 15°C

**(05 marks)**

7. A bag contains 5 green.4 yellow and 3 blue balls, from which three balls are picked at random. Determine the probability that the 3 balls selected will contain;

(a) Exactly two yellow balls **(02 marks)**

(b) At least one green **(03 marks)**

8. A car of mass 1000 kg is travelling a long a level road against a constant resistance of magnitude 475N.The engine of the car is working at 4 kw. Calculate:

(a) Maximum speed of the car **(2 mark**

(b)Acceleration when the car is travelling at **(3 marks)**

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**SECTION B: (60 MARKS)**

Answer any **five** questions from this section.All questions carry equal marks.

9. The lengths in cm of 40 metal rods were as follows:

|  |  |
| --- | --- |
| Lengths | Frequency |
| 30 − < 35 | 8 |
| 35 − < 40 | 5 |
| 40 − < 55 | 12 |
| 55 − < 60 | 9 |
| 60 − < 65 | 6 |

(a) Calculate the mean length and standard deviation **(07 marks)**

(b) Display the data on a histogram and use it to estimate the modal length

**(05 marks)**

10. (a) Show graphically that the equation has a root between -3 and -2

(05 marks)

(b) Use Newton Raphsons method to find the root of the equation in (a) above correct to 4 significant figures. **(07 marks)**

11. The distribution function of a continuous random variable X is as follows:

Find the;

1. Values of constant k **(04 marks)**
2. mean of X **(03 marks)**
3. **(05 marks)**
4. (a) The numbers are calculated with percentage errors of 5, 3 and 1 respectively. Find the limit with in which the exact value of the expression lies **(6 marks)**
5. A mobile money business makes an annual profit of 80 million with a margin error of % and an annual loss of 20 million with a margin error of. Find the range of values corresponding to its gross income **(6 marks)**
6. A particle of mass 5 kg is projected up a rough plane inclined at arcsin to the horizontal with a speed of and moves a distance d meters up the plane before coming to rest. Given the coefficient of friction between the particle and the plane is find the;
7. Initial kinetic energy of the particle **(2 marks)**
8. Potential energy gained in terms of d **(3 marks)**
9. Work done against friction in terms of d (**3 marks)**
10. The value of d (**4 marks**)

END