**ST. JOSEPHS SSS NAGGALAMA**

**S6-mathematics paper 2 assignment**

**By James Mugambe**

**Try out the following questions**

1. A bag contains 6 red, 3 green and 1 blue discs. If three discs are picked at random from the bag without replacement, find the probability that 2 red discs and 1 green disc are picked. (05 marks)
2. A car of mass 1000kg accelerates uniformly from rest to a maximum speed of 90kmh-1 up a smooth inclined plane. If the plane is inclined at 300 to the horizontal, calculate the maximum power of the car. (5marks)
3. The table below shows awarded to nine candidates in English (x) and History (y)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 13 | 15 | 15 | 29 | 20 | 20 | 21 | 21 | 24 |
| y  | 65 | 60 | 76 | 62 | 70 | 75 | 76 | 80 | 70 |

1. Calculate the rank correlation coefficient for the data. (04 marks)

 Comment on your results (1mark)

1. A particle of mass 10kg rests on a rough horizontal plane and is pulled by a force of magnitude $98/\sqrt{3}$N inclined at an angle 600 to the horizontal. If the particle does not move, determine the minimum value of the coefficient of friction between the particle and the plane. (5 marks)
2. A continuous random variable x takes values between 2 and 5, and for $2\leq x\leq 5,$ the probabilit that$X\leq x$ is $ ax-\frac{b}{x^{2}}$where$a$ and $b$ are constants. Find the
3. constants *a* and b (05 marks)
4. P($3<x<4$) (02 marks)
5. Pdf of X (02 marks)

Mean of x

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 sheetsCement Sand Tiles Nails  | 45,00028,000140,00030,0003,500 | 55,00035,000105,00037,0004,800 | 81210422 | 51810315 |

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. The diagram below shows an isosceles trapezium ABCD where AD = DC = CB =1m and AB = 2m. Five forces of magnitudes 1,3,5,6 and $2\sqrt{3 }$ N act along AD, DC, CB, BA and AC respectively, the direction of each force being shown by the order of the letters

 D C

 1200 300

 300

 300 600

 A B

If the resultant force and its line of action cuts AB produced at X. Find the

1. magnitude and direction of the resultant force, (09 marks)

distance AX

1. The table below is the distribution of the distance run during training by members of an athletics club in a particular week.

|  |  |
| --- | --- |
| Distance (km) | Frequency  |
| 31 – 40 41 – 4546 – 5051 – 5556 – 5758 – 6061 – 7071 - 90 | 1015207064242010 |

1. Estimate the standard deviation of the athletics (06 marks)
2. Plot an Ogive and use it to estimate the
3. semi-interquartile range
4. number of athletics who ran between 50.0 and 66.0km. (06 marks)
5. A ball is hit at a point 0, which is at a height of 2m above the ground and at a horizontal distance 4m from the wall, the initial speed being in a direction of 450 above the horizontal. If the ball just clears the wall which is 1m high,
6. show that the equation of path of the ball is$ 16y=16x- 5x^{2}$. (04 marks)
7. calculate the;
8. distance from the net at which the ball strikes the ground. (04 marks)
9. magnitude and direction of the velocity with which the ball strikes the ground.

9 . a) Three particles of weights 2*W*, 3*W*, and 5*W* are located at the points with position vectors$\left(\genfrac{}{}{0pt}{}{1}{1}\right)$,$\left(\genfrac{}{}{0pt}{}{2}{-3}\right),and \left(\genfrac{}{}{0pt}{}{4}{1}\right)$ respectively. Find the coordinates of their Centre of gravity.  ***(04 marks)***

b) A composite lamina *ABCDEFGHIJK* is made of a rectangular lamina *ABCD* 12cm by 6cm, a square lamina *EFGH* of side 8cm and triangular lamina *IJK* welded to the square lamina at I as shown below.



Find the distance from *AB* to the position of Centre of gravity of the composite lamina. ***(06 marks)***

If the lamina is suspended from *B*, find the angle *AB* makes with the vertical. ***(02 marks)***