**PETTA COMMUNITY SECONDARY SCHOOL**

MIDTERM II EXAMS 2015

S.5 PHYSICS PAPER 1 DATE: July 7th

TIME: 2 HOURS

***INSTRUCTIONS;***

***1. Attempt all the questions***

***2. Assume where necessary***

***- Gravitational acceleration g= 9.81Ms-1***

***-Specific heat capacity of water =4200JKg-1K-1***

***-Specific heat capacity of copper=400JKg-1K-1***

SECTION A

1(a)(i) What is meant by scalar and vector quantities? (2)

(ii) Give three examples of each of the quantities in (a)(i) above. (3)

(b)(i) What is meant by uniformly accelerated motion? (1)

(ii) Sketch speed-time and distance-time graphs for a body moving with uniform acceleration. (2)

(c) A ball is kicked from a spot 30m from the goal posts with a velocity of 20m/s at 300 to the horizontal. The ball just, clears the horizontal bar of the goal posts. Find

1. The height of the goal posts (5)
2. The time of flight (4)
3. How far behind the goal posts the ball lands. (3)

2 (a) Find the resultant force for the following system of forces. (4)

1. State the conditions for a system of three coplanar forces to be in equilibrium. (2)

(ii) State Newton’s laws of motion. (3)

(d) The diagram below shows a block X of mass 2kg placed on a rough plane inclined at an angle of 300 to the horizontal. A string which is parallel to the plane and passes over a light smooth pulley connects X to another block Y of mass 3kg.

If the coefficient of friction between block X and the inclined plane is 0.3, Find:

1. The acceleration of the system. (3)
2. The tension in the string. (2)

e (i) State the principle of conservation of linear momentum. (1)

(ii) Show how Newton’s laws of motion can be applied to arrive at the principle stated in (3)

(iii) State two conditions for a collision to be perfectly elastic. (2)

**SECTION B**:

2. a) i)what is a thermometric property*? 1 mark.*

ii) What qualities make a particular thermometric property suitable for use

in a practical thermometer? *2 marks*

iii) List four thermometric properties which are used in thermometry

2 marks

b) i)With reference to an electrical resistance thermometer, outline the

Essential steps involved in the setting up of a Celsius temperature scale

*3 marks*

1. What advantages and disadvantages are there in using a platinum resistance thermometer? *3 marks*

c) i) The temperature θ on a resistance thermometer is given by: Rθ  = Ro(1 + α θ), where α is the temperature coefficient of resistance of the metal of the resistance thermometer.

The resistance of the thermometer is 3.49… at 40oC and 3.56…. at 50oC. What is α ?

What is the temperature of a liquid in which the thermometer has a resistance of 3.79….? *4 marks*

3 a) i) Define specific Heat capacity and give the units in which it is measured

*2 marks*

1. Explain how you would determine the specific Heat Capacity of a piece

of copper. State any assumptions and precautions taken. *6 marks*

1. A metal of mass 500g is heated to 120oC and dropped into 100g of water of

20oC, contained in a copper can of mass 200g and specific Heat capacity 0.43KJkg-1k-1. The final temperature reached by the mixture was 45oC.

What is the specific Heat Capacity of the metal? 4*marks*

c) i) The temperature of 0.45kg of water in a calorimeter of Heat capacity

80JK-1 is increased from 288K to 352K in 480S by an electrical heater. Neglecting heat losses, calculate the power of the heater. *3 marks*

*Physics Department Petta Community S.S*