

**MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**P.O. Box 972-60200 – Meru-Kenya**

**Tel: 020-2069349, 061-2309217. 064-30320 Cell phone: +254 712524293, +254 789151411**

**Fax: 064-30321**

**Website:** [**www.must.ac.ke**](http://www.must.ac.ke) **Email:** [**info@must.ac.ke**](mailto:info@must.ac.ke)

**University Examinations 2015/2016**

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR CERTIFICATE IN ELECTRICAL INSTALLATION

**SPS 1110: PHYSICAL SCIENCES**

**DATE: AUGUST, 2016 TIME: 1½HOURS**

**INSTRUCTIONS:** *Answer questions* ***one******Compulsory*** *and any other* ***two*** *questions*

**QUESTION ONE - (30 MARKS)**

1. Define the following terms:
2. An acid (1 Mark)
3. A base (1 Mark)
4. Salts (1 Mark)
5. A ball of mass 50g falls from a height of 2m onto a floor and rebounces to a height of 1.4M. Calculate;
6. The potential energy before fall. (3 Marks)
7. The kinetic energy of the ball as it hits the ground. (3 Marks)
8. Draw the structural formula for each of the following compounds;
9. 3-ethylhexane (2 Marks)
10. 3-methylheptane (2 Marks)
11. (i) Define ‘moment of force’ and give its SI units. (2 Marks)

(ii) A metre rule of mass 5g was balanced as shown.



Calculate the value of F. (4 Marks)

1. Define the following terms; (4 Marks)
2. An atom
3. Atomic number
4. Mass number
5. Isotopes
6. Calculate the wavelength of the first three spectral lines in lyman series. (4 Marks)

Hint; 

1. A body started from rest and achieved a velocity 72km/hr in 20s. Calculate ;
2. its acceleration (2 Marks)
3. Distance travelled. (1 Mark)

**QUESTION TWO (15 MARKS)**

1. Differentiate between the following terms;
2. Distance and displacement (2 Marks)
3. Speed and velocity (2 Marks)
4. The graph below shows the motion of a point mass from point O to C.



1. Describe the motion of the car from O to C (3 Marks)
2. Calculate the acceleration during the intervals AO, AB and BC. (3 Marks)
3. Calculate the distance travelled during each time interval. (5 Marks)

**QUESTION THREE (15 MARKS)**

1. Explain the following terms;
2. Angular displacement (1 Mark)
3. Angular velocity (1 Mark)
4. Calculate the centripetal force required to maintain a body of mass 20kg in a circular path of radius 2.8m, travelling at 20m/s. (3 Marks)
5. A point mass covered an arc length 10cm in 4 seconds. If the radius of the circular path was 16cm,Calculate;
6. Linear velocity of the point mass (3 Marks)
7. Its angular velocity (3 Marks)
8. Its frequency (2 Marks)
9. The periodic time of the particle (2 Marks)

**QUESTION FOUR (15 MARKS)**

1. Draw the electronic configuration of an atom whose atomic number Z = 14 (2 Marks)
2. Explain why molten magnesium chloride conducts electricity whereas solid magnesium chloride does not, (2 Marks)
3. Write the molecular and structural formula of alkanes and alkenes. (4 Marks)
4. Write well balanced equations for the reactions between;
5. Hydrochloric acid and sodium hydrogen carbonate. (2 Marks)
6. Sulphuric acid and calcium carbonate. (2 Marks)
7. Complete the following reactions; (3 Marks)



