



TECHICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

PRE-CERTIFICATE IN INFORMATION TECHNOLOGY

**APS 1003: FUNDAMENTALS OF PHYSICS**

SPECIAL/SUPPLEMENTARY EXAMINATION

**SERIES: FEBRUARY 2013**

**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions

Answer question **ONE** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

**SECTION A (COMPULSORY)**

**Question One (20 marks)**

- a) Define:
- i) Refraction (2 marks)
  - ii) Reflection (2 marks)
  - iii) Molecules (2 marks)
  - iv) Current (2 marks)
- b) A block of mass 5kg rest on a friction free plane. What is the acceleration of the block if a horizontal force of 20.0N is applied on it. (4 marks)
- c) A  $4\ \Omega$  resistor has a current of 10A through it. What is the potential difference across the resistor? (4 marks)
- d) Differentiate between series and parallel connections. (4 marks)

**SECTION B (Answer Any Two Questions)**

**Question Two (20 marks)**

- a) A helicopter leaves an airstrip on a day and later sighted 200km away in the direction making an angle of  $25^\circ$  east of north. How far east and how far north is the plane from its base? (10 marks)
- b) A 5000kg car starts from rest with constant acceleration of  $4.00\text{m/s}^2$ . Find the kinetic energy of the car during the first second and during the following second. (10 marks)

**Question Three (20 marks)**

- a) Two insulated small objects of  $1.0\text{C}$  and  $-2.0\text{C}$  are 50cm apart. What is the electrostatic force acting on each object? (8 marks)
- b) Discuss the effects of electric current on:
- i) Heating (6 marks)
  - ii) Magnetism (6 marks)

**Question Four (20 marks)**

10 ripples of water pass through a point in 6 seconds. If the distance between the 1<sup>st</sup> and 11<sup>th</sup> is 60cm. Calculate:

- Frequency (5 marks)
- i) Period (5 marks)
  - ii) Wave length (5 marks)
  - iii) Velocity of the waves (5 marks)

**Question Five (20 marks)**

- a) Define and write their SI units.
- i) Mass (2 marks)
  - ii) Density (2 marks)
  - iii) Volume (2 marks)
  - iv) Length (2 marks)
  - v) Temperature (2 marks)

- b) A metal Y melts at 1024 k and boils at 3410k at atmospheric pressure. Express these temperatures in degree.
- i) Celcius (5 marks)
  - ii) Fahrenheit (5 marks)