



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Applied & Health Sciences

DEPARTMENT OF MATHEMATICS & PHYSICS

DIPLOMA IN SCIENCE LABORATORY TECHNOLOGY (DSL T 12J)

AMA 2101: MATHEMATICS FOR SCIENCE

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: JUNE/JULY 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions

Answer question **ONE (COMPULSORY)** and any **TWO** questions

Maximum marks for each part of a question are clearly shown

This paper consists of **FOUR** printed pages

SECTION A (COMPULSORY)

Question 1

- a) A hydraulic machine was a large circular piston of radius 8cm and a circular plunger of radius 0.4m. A force of 200N is exerted on the plunger. Find the force exerted on the piston. (4 marks)
- b) Show that the velocity of a wave, v is given by the formula $v = f\lambda$ where f is the frequency of the wave and λ is its wavelength. (4 marks)
- c) 80cm³ of water is mixed if there is no change in total volume on mixing? (4 marks)
- d) Give single units to present the following:
- (i) One Newton x one metre.
 - (ii) One Newton per square metre
 - (iii) One joule per second
 - (iv) Kilogram x metre per second squared. (4 marks)
- e) From the following types of electromagnetic radiations, ultraviolet, gamma rays and radio waves:
- (i) Which one has the longest wavelength
 - (ii) Which one has the highest frequency? (2 marks)
- f) The density of liquid mercury is $1.36 \times 10^4 \text{ kgm}^{-3}$. Determine the liquid pressure at a point 74cm below the surface of mercury. (Take $g = 10\text{N/kg}$) (3 marks)
- g) Convert the following into their SI units: (4 marks)
- (i) 72Km/h
 - (ii) 13.6g/cm

SECTION B (Answer any TWO questions from this section)

Question 2

Question 3

Question 4

Question 5