NATIONAL OPEN UNIVERSITY OF NIGERIA
14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS
SCHOOL OF SCIENCE AND TECHNOLOGY
MARCH/APRIL 2014 EXAMINATION

COURSE CODE: MTH 417
COURSE TITLE: ELECTROMAGNETIC THEORY
TIME ALLOWED: 3HOURS
INSTRUCTION: QUESTION ONE IS COMPULSORY. ANSWER ANY OTHER THREE QUESTIONS.

1. State and explain each of the four Maxwell's equations.
20marks

2. A) State Gauss's divergence theorem and
8marks

b) State Stokes theorem.
8marks

3. Apply Gauss's divergence theorem to the first two of Maxwell's equations. Compare their resulting equations.

17marks

4. A) Derive the wave equation for the electric field, using the third of Maxwell's equations and take the curl of both sides
9marks

B) Derive the wave equation for the magnetic field. Using the last of Maxwell's equations, 8marks

5. a) Determine whether light waves are longitudinal or transverse waves.
10marks

b) State the Lenz’s law
7marks

The total obtainable marks are 70 marks. Good Luck.