



NATIONAL OPEN UNIVERSITY OF NIGERIA

91 Cadastral zone, Nnamdi Azikiwe Expressway, Jabi, Abuja

FACULTY OF EDUCATION

DEPARTMENT OF SCIENCE EDUCATION

EXAMINATION: 2021_1

COURSE CODE: SED323

COURSE TITLE: PHYSICS FOR INTEGRATED SCIENCE III

CREDIT UNIT: 2

TIME ALLOWED: 2HOURS

INSTRUCTION: ANSWER QUESTION ONE AND ANY OTHER TWO

1a. Write short note on the following: (i) A magnet (ii) Magnetic field **(10 marks)**

1b) State the factors that constitute the **quantity of force** on a conductor in a magnetic field. **(10 marks)**

1c) An electron experiences a force $F = (3.2i - 2.7j) \times 10^{-13} \text{N}$ when passing through a magnetic field $B = (0.72)T$. What is the electron's velocity? **(10 marks)**

TOTAL = 30 MARKS

2a) Why is Lenz's law in consonance with the law of conservation of energy?
(10 marks)

b) A straight horizontal wire carries a current of 65A from west to east in a region where the magnetic field is 45° towards the north east with magnitude 1.2T. Find the magnitude of the force on a 2m section wire. **(10 marks)**

TOTAL = 20 MARKS

3a) (i) Explain what is meant by a field as used in physics. **(4 marks)**

(i) Mention three types of field known to you. **(6 marks)**

b) A transformer has 450 turns in the primary coil and 260 turns in the secondary coil. If the primary coil is connected to 220V mains. What voltage will be obtained from the secondary coil? What type of transformer is this? **(10 marks)**

TOTAL = 20 MARKS

4a) State the differences between an alternating current and direct current in generator? **(8 marks)**

b) A transformer which can produce 24V from 240V has efficiency of the 90% and the current in the secondary is 20A. Calculate the current in the 240V supply. **(12 marks)**

TOTAL = 20 MARKS