

LAGOS CITY POLYTECHNIC, IKEJA
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
DEPARTMENT OF ELECT/ELECT ENGINEERING
2015/2016 SEMESTER EXAMINATION

COURSE TITLE:	ELECTRICAL MAT. SCIENCE	NO OF QUESTION :	6
COURSE CODE:	EEC 315	TIME ALLOWED:	2 HRS
FOR WHOM:	HND YR I EE	PT INSTRUCTIONS:	ANSWER
ANY FOUR	QUESTIONS		

1. (a) Define the following:
 - (i) Material Science
 - (ii) Material Engineering
 (b) List and explain the six(6) most important properties of Solid Materials.

2. (a) Explain the following:
 - (i) JJ Thompson model of atom
 - (ii) Bohr theory of Hydrogen atom
 (b) An electron has a Mass of 9.11×10^{-31} kg and is moving at a speed of 10^4 m/s to an accuracy of 0.075%. Find the minimum uncertainty in determining the position of this electron.

3. (a) With the Aid of diagrams, Explain the following
 - (i) Conductors
 - (ii) Semi Conductor
 - (iii) Insulator
 (b) Using a Diagram, Describe
 - (i) Valence band
 - (ii) Conduction band
 - (iii) Energy Gap

4. Explain the following using diagram
 - (i) Conic banding
 - (ii) Covalent banding
 - (iii) Valence band
 - (iv) Conduction band
 - (v) Fermi level

5. (a) (i) Write the equation representing the electrical potential energy of the atom and the kinetic Energy (K.E) of the electron.
 - (ii) What does the negative sign represent
 (b) If $h = 6.6 \times 10^{-34}$ e = 1.9×10^{-19} , r = 6.2m Calculate the energy(E)
 (c) Write the equation for total energy

6. (a) State Paulis Exclusion Principle and Heisenberg uncertainty principle.
 (b) The uncertainty in the position x of an electron moving, through a cathode Ray Tube is 10m. What is the uncertainty in the simultaneous measurement of the velocity of the electron. Assuming the mass is 15×10^{-30} kg. Assume $h = 6.6 \times 10^{-34}$

