International Islamic University Chittagong
Department of Electrical and Electronic Engineering

Final Assignment Test Autumn-2020 Program: B.Sc. Engg. (EEE)
Course Code: **EEE-3515** Course Title: **Electrical Properties of Material**
Time: **5 hours** (Writing -**4 hours 30 minutes** + **30 minutes** submission time) Full Marks: **50** (**Written** 30 + **Viva/Viva-Quiz**-20)

[Answer each of the questions from the followings; Figures in the right margin indicate full marks. Answer script must be submitted through online method within 5 hours from starting time. Also, write down the Q. Set on the front page of your answer script]

SET-C

1(a).	Fermi Energy and Work function of some common materials are given in the following table. Sketch the approximate energy diagram showing the Vaccum level, Work function and Fermi levels for the materials. Maintain relative energy scale in the sketch. Consider Vaccum as the reference energy level.	3	**CO2**	Ap
1(b).	Explain the conditions of molecular bonding using suitable example.	3	**CO2**	E
2(a).	How the density of states is less at the bottom and top of the band? Explain with suitable example.	3	**CO2**	E
2(b).	Let us consider that the width of the energy band is 15 eV. Consider the bottom of the energy band as reference i.e. 0 eV. Determine the following parameters in cm^{-3} and in per eV. i) Density of states at the 10 eV from the bottom of the band. ii) The number of states at the 10 eV of the band considering from the bottom level. Calculate the number of states within a small energy range 0.5KT about that energy level.	3	**CO2**	Ap
3.	Discuss the reason of higher electronic polarization for the material having covalent bond compared to other solid that do not have covalent bonding.	6	**CO2**	An
4.	What do you understand by magnetization vetor M per unit volume? Prove that the magnetizing surface current I_m is equal to the total Magnetization per unit volume.	6	**CO2**	E
5.	Distinguish between type I and type II superconductors using their characteristics curves (Temperature vs Critical field and Field vs Magnetization).	6	**CO2**	An+E
6.	Viva/Viva-Quiz: The time of viva/viva-quiz will be declared in Google classroom.	**20**		

	Cu	Li
Φ	4.65	2.9
E_F	7.0	4.7