VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

Continuous Assessment Test – I

Programme Name & Branch: B.Tech and ECE

Course Code & Name: ECE1006-Introduction to Nanoscience and Nanotechnology

Class Number: VL2019201001488, 1492, 1496   **Slot:** A1

Exam Duration: 90 mins   **Date:** 18-08-2019   **Maximum Marks:** 50

General instructions:

- Calculators are allowed!
- Answer should be specific to the questions.
- Point by point answer is highly recommended instead of writing paragraphs

Questions

1. Identify and explain about a distribution function that obeys Pauli exclusion principle and find the probability of electron occupancy at T=0 K below and above the Fermi level with proper plot. **(10)**

2. Explain about the band theory of solids? Using the band theory, classify solid materials based on their electrical conductivity.**(12)**

3. Justify with proper mathematical derivation that the energy of electrons is confined in two dimensions and free to move in one dimension for quantum wires. **(13)**

4. Discuss about the following material properties at nanoscale. (a) Electronic (b) Optical (c) Magnetic **(15)**

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