



**B.Sc. VI Semester Degree Examination, May/June - 2019**

**PHYSICS**

**MATERIAL SCIENCE AND ELECTRONICS-II**

**PAPER NO : VIII-6.2**

**(New)**

Time : 3 Hours

Maximum Marks : 80

**Instructions to Candidates:**

1. Answer *All the Questions of Section A in the First two pages only.*
2. Answer *any Five Questions of Section B and Four Questions from Section C.*

**SECTION - A**

**L Answer all of the following: (15×1=15)**

- 1) Write one property of Mechanical of ceramics.
- 2) Give one example for covalent bonding in materials.
- 3) Define Hooke's law.
- 4) Write the expression for electrical conductivity in metals.
- 5) Define thin Film.
- 6) Write one physical method for the preparation of thin Film.
- 7) Define Size effect of the nano materials.
- 8) What is an Amplifier?
- 9) Define negative Feedback.
- 10) Write Barkhausen criterion for Oscillation.
- 11) What is the base value of hexadecimal system?
- 12) Write the truth table for half adder.
- 13) What is Shift register?
- 14) Define Amplitude modulation.
- 15) What is dynamic range of a radio receiver?

(2)

**SECTION - B**

(5×5=25)

**II. Answer any Five of the following:**

- 16) Explain engineering classification of materials.
- 17) Explain ionic bonding in materials with example.
- 18) Derive an expression for electrical conductivity of metals.
- 19) Explain briefly Strength and hardness of materials.
- 20) Describe sputtering technique for the preparation of thin film.
- 21) Explain full adder with neat diagram and truth table.
- 22) Write a note on need for modulation.

**SECTION - C**

**III. Answer any Four of the following:**

(4×10=40)

- 23) a. Compare crystalline and non crystalline state of materials.  
b. Explain metallic bonding in materials with example. (5+5)
- 24) a. Write a note on Quantum structure of nanomaterials.  
b. Derive an expression for correlation with Quantum mechanical particle in a box. (5+5)
- 25) a. Explain the working of single state CE Amplifier.  
b. Explain equivalent circuit of common emitter amplifier using hybrid parameter. (5+5)
- 26) a. Explain working of phase shift oscillator.  
b. Write a note on Astable multivibrator. (5+5)
- 27) a. Explain Logic gates OR, AND and NAND gates using diode and transistor.  
b. Write a note on flip-flops. (5+5)
- 28) a. Derive the power relation in AM wave.  
b. Describe Superheterodyne receiver with neat block diagram. (5+5)