

## **B. Sc. Physics Hons.**

### **Semester – VI**

#### **ANALOG ELECTRONICS AND SOLID STATE PHYSICS**

#### **[ MODEL QUESTIONS ]**

#### **Long Answer Type**

1. What do you mean by feedback? Distinguish between negative and positive feedback. What are the characteristics of feedback amplifier?
2. What is an Oscillator? Discuss Barkhausen criterion for oscillation.
3. Discuss the Bode Plot? Compare between a voltage amplifier and a power amplifier.
4. Explain amplifier configuration suitable for cascading. Discuss the circuit and frequency response of a two-stage R-C coupled amplifier.
5. What is an Operational Amplifier? Describe various Operational Amplifier parameters.
6. Discuss CMRR? What are the characteristics of an Operational Amplifier?
7. What is meant by modulation? Describe with features various types of Modulation.
8. Obtain an expression for Detection Efficiency. Describe various types of modulator circuits commonly used for Amplitude Modulation.
9. Describe Kronig – Penney model of electrons moving in periodic potential. How does it lead to the formation of forbidden energy gaps?
10. Obtain London's equations in superconductivity. What is its drawback?
11. Write short notes on any two of the following:
  - (a) Classification of Amplifiers
  - (b) Push Pull Amplifier
  - (c) Superconductivity
  - (d) Demodulation

#### **Short Answer Type**

1. What is skew rate? Discuss the circuit model of an ideal Op-Amp.
2. Explain the concept of Op-Amp virtual ground.
3. What is an astable multivibrator? Draw the diagram of Hartley oscillator.
4. What do you mean by the criteria of oscillations?
5. What do you mean by loop-gain? Distinguish between open-loop and closed loop gains.
6. Why is the amplifier gain plotted in decibels? Discuss Nyquist criteria.
7. Elaborate various effects of negative feedback on noise and bandwidth of the amplifier?
8. What do you mean by diode detector? Mention the advantages of it.
9. Write about Brillouin zone? How is it constructed?
10. What is superconductor? What are its properties?

#### **First Reference:**

- Undergraduate ANALOG SYSTEMS AND APPLICATIONS, NUTAL LATA, PRAGATI PRAKASHAN.
- Introduction to SOLID STATE PHYSICS, ARUN KUMAR, PHI.

#### **Second Reference:**

- A FIRST COURSE IN ELECTRONICS, A. A. Khan & K. K. Dey, PHI.
- SOLID STATE PHYSICS, S. O. Pillai, NEW AGE INTERNATIONAL PUBLISHERS.