(180-PA-203311B) Roll No. .....

PAPER ID—10114

B. Sc. EXAMINATION, 2024

(Second Semester)

ELECTRO MAGNETIC INDUCTION AND ELECTRONIC DEVICES

Code : PHY-202

Time : 3 Hours *Maximum Marks : 45*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) State and explain Lenz's law. Show that Lenz's law is a consequence of conservation of energy principle. 6

(b) A coil of resistance R and inductance L is connected to a battery of e.m.f. E volt. In what time does the current rise to 99% of its final value ? 3

2. (a) Define quality factor and calculate its value for a series resonant circuit. 4

(b) A charged condenser discharges through inductance and a resistance. Discuss the nature of discharge. 5

Unit II

3. (a) Explain, how Hall Effect can be used to determine the nature of charge carriers in a conductor. 5

(b) What is a solar cell ? Discuss its V-I characteristics. 4

4. (a) What do you understand by ripple factor ? How can it be increase and decreased, explain mechanism ? 5

(b) Draw a block diagram of a regulated power supply and explain role of each component. 4

5. (a) Draw a circuit and describe the method to obtain characteristics of a *pnp* transistor in CB configuration. **6**

(b) Is CC configuration of transistor an amplifier ? Explain its use. **3**

Unit III

6. (a) Describe a fixed bias method. What are its advantages and disadvantages ? **6**

(b) An amplifier has a gain of 50 and a distortion of 5%. If a negative voltage feedback with feedback fraction of 0.01 is used, find the distortion limits in output. **3**

7. (a) Draw a circuit for biasing of transistor with emitter and explain its action for bias stabilization. Why is it seldom used ? **6**

(b) Discuss the important characteristics of emitter follower. **3**

8. (a) What are sustained oscillations ? Explain Barkhausen criterion of sustained oscillations. **6**

(b) In what way, a Collpitt's oscillator is different from a Hartley oscillator ? **3**