

- (b) What do you mean by rectifier efficiency and ripple factor ?
- (c) Differentiate between intrinsic and extrinsic semiconductors.
- (d) Define α and β of transistor and derive relation between them.
- (e) Define Barkhausen criterion.
- (f) Which biasing is more stable for BJT ?
- (g) Discuss Slew rate.
- (h) How oscillator is differ from an amplifier ?
- (i) Define Boolean algebra with its advantage.
- (j) What is the role of horizontal and vertical deflection plates in CRT ? $2 \times 10 = 20$

Roll No.

Roll No. 04

July-22-00204

B. Tech. EXAMINATION, 2022

Semester I (CBCS)

FUNDAMENTALS OF ELECTRONICS
ENGINEERING

EC-101

Time : 3 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. (a) Define Energy band diagram. Classify conductor, insulator and semiconductor on the basis of energy band diagram. 5

- (b) Describe LED with its principle of operation, working and characteristics. 5
2. (a) Draw and explain working of full-wave rectifier. Determine average and rms value of output voltage for it. 5
- (b) Explain the working of Zener diode as voltage regulator. 5

Section B

3. (a) Explain the construction and working of CB configuration of a transistor. 5
- (b) Compare FET and BJT with their advantages and disadvantages. 5
4. (a) Explain the operation of N Channel JFET with its characteristics curve. 5
- (b) Draw the structure of depletion type P-MOSFET and explain its working. Also draw its characteristics curves. 5

Section C

5. (a) What is Oscillator ? Enumerate different classes of oscillator. 5

- (b) Draw the circuit diagram of Hartley Oscillator and explain its working operation. 5

6. (a) Define Op-amp. Draw its block diagram and explain each block. 5
- (b) Draw and explain Op-amp as a summer and average amplifier. Derive expression for their output voltage. 5

Section D

7. (a) Perform the following subtraction using 1's complement and 2's complement method : 5
- (i) $(1011)_2 - (1100)_2$
- (ii) $(101)_2 - (100)_2$
- (b) What do you mean by Universal Gates ? Discuss NAND gate as universal gate. 5
8. (a) Draw and explain block diagram of CRO. 5
- (b) How voltage and phase is measured in CRO ? 5

(Compulsory Question)

9. (a) Draw VI characteristics of *pn* junction diode and zener diode.