Roll No. .....

E–1541

B. Voc. (First Semester)

EXAMINATION, Dec.-Jan., 2020-21

(New Course)

FUNDAMENTAL OF ELECTRONICS

(RETEM–101)

Time : Three Hours] [*Maximum Marks : 80*

Note : Attempt all *four* questions. *One* set of (a) and (b) from each unit is compulsory. All questions carry equal marks.

Unit—I

1. (a) Using the concept of electron and hole current, derive an expression for the conductivity of a semiconductor.

   (b) (i) Distinguish between metals, insulators, and semi-conductor on the basis of band theory.

   (ii) Distinguish between n-type and p-type semiconductors.

Or

(a) Explain the use of current and voltage sources in electronics. Draw and describe the characteristics of ideal current and voltage sources.

(b) (i) Explain the variation of conductivity of a semiconductor with temperature.

(ii) What is an intrinsic semi-conductor ? How can this material be converted into an extrinsic semiconductor ?

Unit—II

2. (a) With the help of a circuit diagram explains full-wave rectification. Draw the waveforms of input and output voltages. Why is filter use in rectifier ?

(b) What is a clipping circuit ? Draw the circuit diagram and explain how the circuit works.

Or

(a) (i) What is zener diode give its symbol ? Explain its use as a voltage regulator. What is the difference between an ordinary semi-conductor and a zener diode ?

(ii) Draw the I-V curve of the following :

(I) PN-junction diode

(II) Zener diode

(b) Explain the bridge rectifier with the help of a circuit diagram. Compare with a full rectifier.

Unit—III

3. (a) (i) Why the FET is a called voltage amp and BJT a current amplifier.

(ii) In a transistor, the forward bias is always smaller than the reverse bias. Why ?

(b) With the help of a labeled circuit diagram explain the use of the n-p-n transistor as a CE-amplifier. Discuss the phase relationship between the input and the output voltages. Write an expression for various gains of a CE amplifier.

Or

(a) (i) Why a transistor cannot be used as a rectifier ?

(ii) Why is the base region of a transistor make very thin and lightly doped ?

(b) Why are junction transistors called bi-polar devices ? Draw the CE circuit of a junction transistor. Sketch its output characteristics and indicate the active, saturation, and cut-off regions.

Unit—IV

4. (a) (i) What are primary and secondary batteries ? Give *one* example for each.

(ii) Explain the effect of temperature on the battery.

(b) Describe the classification of lead storage batteries.

Or

(a) What is a lead-acid battery describe its types, working, and applications ?

(b) Describe the types of batteries.