

EC - 304**B.E. III Semester**

Examination, June 2016

Electronics Devices**Time : Three Hours****Maximum Marks : 70**

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each question are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What is meant by mean life time of a charge carrier?
 b) Define work function of Metal.
 c) What is Hall effect?
 d) Derive an expression for the contact potential difference of a PN junction in terms of the doping concentrations on the p and n sides of the junction respectively.

OR

Explain the origin of Diffusion capacitance. Derive the relation for diffusion capacitance.

2. a) What is clipper?
 b) Draw the circuit of a capacitor filter.
 c) Draw the circuit of a bridge rectifier.
 d) What does a load line draw on a diode's characteristic curve represent? How does a diode's dynamic characteristic curve differ from its static characteristic curve.

OR

Draw the clamper circuit and explain its operation and write some applications of the same.

3. a) Write applications of Varactor diode.
 b) Draw the characteristic curve of tunnel diode.
 c) What is Schottky diode?
 d) Briefly discuss working of a photo diode. Draw its volt ampere characteristic and explain its sensitivity with position of illumination.

OR

Explain qualitatively working and operation of light emitting diodes (LED), which materials are preferred for their fabrication.

4. a) Why does a silicon transistor requires just 0 volts at the Base Emitter (B-E) junction for cut off?
 b) Define α and β . Derive the relationship between them.
 c) Sketch input and output characteristics of CE transistor configuration.
 d) What is the condition of cut-off of a transistor in CE configuration? Show that a small reverse bias voltage is required at the B-E junction of a Germanium transistor for cut-off, while the cut-in condition requires a small forward bias.

OR

Using the Ebers-Moll equation, analyze the behavior of BJT in cut off active and saturation regions. Find estimated value of:

- i) Cut-in voltage ii) Saturation voltage

5. a) Write the applications of MOSFET.
 b) Discuss the construction of MOSFET.
 c) What is the difference between BJT and FET?
 d) The threshold voltage of MOSFET is dependent on temperature. Derive the relation showing that threshold voltage falls with increasing temperature.

OR

Explain the working of a JEFT and give its characteristic curves.
