Total No. of Questions :9] *[Total No. of Printed Pages :3*

Roll No .....

EC - 304

B.E. III Semester

Examination, December 2012

Electronics devices

Time : Three Hours

Maximum Marks : 70/100

Note : *1. Attempt any Five questions.*
2. All questions carry equal marks.

1. a) Explain the behaviour of a Pn junction under the following conditions:
   i) Unbiased
   ii) Forward biased and
   iii) Reverse biased
   Sketch the relevant characteristics.

   b) Define the following terms with reference to a semiconductor diode
   i) Barrier potential
   ii) Cut in voltage
   iii) The reverse saturation current
   iv) Depletion layer
   v) Dynamic forward resistance

2. a) Draw the VI characteristic of a semiconductor diode. Give the equation for the current in semiconductor diode and with the help of this equation explain in detail VI characteristic of a semiconductor diode.

   b) What is Hall effect and Hall coefficient explain? Describe the applications of Hall effect.

3. a) Explain the working of a zener diode. Describe with the help of a circuit diagram, the working of a voltage regulator using zener diode.

   b) Describe the working and applications of following diodes

      i) Varactor diode

      ii) LED

4. a) Draw positive clipper circuit. Show input and output waveform and explain its working.

   b) Draw and explain the diode clamper or dc restorer. Show input and output waveforms and briefly explain the operation of the circuit.

5. a) Draw a schematic diagram of a transistor indicating the different currents define α and β of a transistor and obtain the relation between them.

   b) How will you draw dc load line on the output characteristics of a transistor. What is its importance? Define operating point. Also explain cut off, active and saturation region.

6. a) Give the functional diagram, symbol and characteristics graph of UJT. Also describe its principle of operation.

b) What are the different transistor configurations for a transistor. Identify the input and output current in each of them and write the expressions for the current gains. Also compare the characteristics of the transistor in three possible configurations.

7. a) Describe the construction and operation of FET. What is the difference between N channel and P channel JFET.
   b) Draw the transfer characteristics of JFET and explain it in detail.

8. a) Give the construction, operation, characteristics and applications of enhancement MOSFET.
   b) Compare the following:
      i) FET and BJT
      ii) FET and MOSFET
      iii) Enhancement MOSFET and depletion MOSFET

9. Write short notes on any two of the following:
   i) Application of diode as rectifier
   ii) Power dissipation in transistor
   iii) Photo transistor
   iv) Tunnel diode
   v) Transition and diffusion capacitance.

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