Roll No.....

EC - 304

B.E. III Semester

Examination, December 2015

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.

Unit - I

1. a) Give the energy band description of semiconductor.
   b) Differentiate between diffusion and transition capacitance.
   c) Discuss the effect of temperature on semiconductor.
   d) What is p-n Junction? Explain the formation of potential barrier in p-n Junction.

OR

Write short note on :

i) Limitation in the operating condition of p-n junction.

ii) Knee voltage

Unit - II

2. a) Discuss the importance of Peak inverse voltage in rectifier.
   b) An ac voltage of peak value 20V is connected in series with a silicon-diode and Load Resistance of 500Ω. If the forward resistance of diode is 10Ω, find peak current through diode.
   c) What is ripple factor? What is its value for half wave rectifier?
   d) Explain the working of full wave bridge rectifier.

OR

With the help of diagram differentiate between a Clipper and Clamper circuit.

Unit - III

3. a) What is Schottky diode? Write three applications of it.
   b) Discuss the mechanism of avalanche breakdown.
   c) Draw the V-I characteristic of Zener diode and write the advantages and disadvantages of zener diode.
   d) Write short note on :
      i) Photo diode ii) Photo transistor

OR

Explain how zener diode maintains constant current across the load.

Unit - IV

4. a) Define the following:
      i) Voltage gain ii) Power gain
      iii) Effective collector load
   b) In a common base connection, current amplification factor is 0.9, if the emitter current is 1mA, determine the value of base current.
   c) Explain the operation of transistor as an amplifier.
   d) Write a short note on:
      i) Ebers moll model
      ii) Uni-Junction Transistor (UJT)

OR

Draw the input and output characteristics of CB connection. What do you infer from these characteristics.

Unit - V

5. a) Define pinch off voltage V_P.
   b) Define NMOS and PMOS devices.
   c) State the properties of MOSFET. (Any three)
   d) Explain the basic operation and characteristics of P-channel depletion type MOSFET.

OR

Given $I_{DSS} = 6mA$ and $V_P = -4.5V$

i) Determine I_D at $V_{GS} = -2$ and $-3.6V$

ii) Determine V_{GS} at $I_D = 3$ and $5.5mA$

******