

**EE - 304**  
**B.E. III Semester Examination, December 2014**  
**Semiconductor Devices and Circuits**

**Time : Three Hours**

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice. *Maximum Marks : 70*  
ii) All parts of each questions 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) What do you mean by temperature co-efficient.  
b) Explain varactor diode in brief.  
c) Explain LED with diagram.  
d) Draw the diagram of FET and explain its working with diagram.

OR

Draw the diagram of P-N junction diode and explain its working with characteristics and also write its application.

**Unit - II**

2. a) Define thermal stability.  
b) Define h-parameter for a BJT transistor.  
c) Draw the h-parameter equivalent diagram of CC.  
d) For a CE amplifier with h-parameter  $h_{ie} = 2 \text{ k}\Omega$ ,  $h_{re} = 6 \times 10^{-3}$ ,  $h_{fe} = 50$ ,  $h_{oe} = 25 \mu\text{A/V}$  and load resistance  $R_L = 4 \text{ k}\Omega$ . And source resistance  $R_s = 10 \text{ k}\Omega$ . compute  $A_v$ ,  $A_i$ ,  $R_i$  and  $R_o$ .

OR

Find out the h-parameter of CE and draw its equivalent h-parameter circuit diagram.

**Unit - III**

3. a) Distinguish between positive feedback and negative feedback.  
b) Draw the circuit diagram of RC phase shift oscillators.  
c) Explain emitter follower circuit with diagram.  
d) Draw the diagram of class-A power Amplifier and explain its working.

OR

Draw the circuit diagram of crystal oscillator and explain its working.

**Unit - IV**

4. a) What is clipper?  
b) Define CMRR and slew rate.  
c) Distinguish between monostable and bistable.  
d) Draw the circuit diagram of astable multivibrators and explain its working.

OR

Explain Darlington pair with circuit diagram and write its application.

**Unit - V**

5. a) What are the characteristic of ideal operational-Amplifier?  
b) What is a differential amplifier?  
c) Distinguish between log and antilog amplifier.  
d) Explain integrator amplifier with neat sketch diagram.

OR

Draw the circuit diagram of instrumentation amplifier and explain its working.