Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Electronics Engg.) (2012 Onwards) (Sem.–3)
B.Tech.(ECE/Electronics & Computer Engg./ETE)
(2011 Onwards)
ANALOG DEVICES & CIRCUITS
Subject Code : BTEC-301
Paper ID : [A1130]

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.**

SECTION – A

1. Write briefly :

a) How is LED different from an ordinary PN junction diode?

b) How does conductivity of a semiconductor change with rise in its temperature?

c) Can two diodes connected back to back behave as a transistor? Give brief justification.

d) Why power amplifiers are called large signal amplifier?

e) Open loop gain of amplifier is 60000 and closed loop gain with negative feedback is 300. If open loop upper cut-off frequency is 15kHz, what is the closed loop frequency?

f) State the Barkhausen criteria for oscillator.

g) Why tunnel diode is called as negative resistance diode?

h) Define the threshold voltage of MOSFET.

i) Why it is required to have a stable Q-point of an amplifier?

j) What is the effect of high frequencies on RC coupled amplifier gain characteristics?

SECTION-B

2. Discuss the working of Zener as voltage regulator. Derive the expression for source and load effect.

3. Discuss the phase shift network attenuation and amplifier gain requirement in a Wein Bridge oscillator. Write its frequency equation.

4. In a Class C amplifier with 1MHz signal frequency, determine the suitable tank circuit component values. Calculate the max AC power delivered to the load if V_{CEmax} = 0.5V, Vcc = 30V, R_L = 1.2kΩ.

5. Using well labeled I-V characteristics briefly explain the UJT operation.

6. Sketch the T-equivalent circuit of CB configuration. Identify and discuss the origin of each component.

SECTION-C

7. What is a small signal amplifier? Explain why the voltage divider with emitter resistor is considered to be the best biasing arrangement for stabilization of Q-point? What is the effect of not connecting an emitter by pass capacitor?

8. a) Derive the Input and Output impedance, Current and Voltage gain of CE amplifier using h-parameter equivalent circuit.

   b) Calculate these circuit parameters for the circuit shown in figure1. Transistor h-parameters are : h_{fe} = 75, h_{ie} = 2.1kΩ, h_{oe} = lμS.

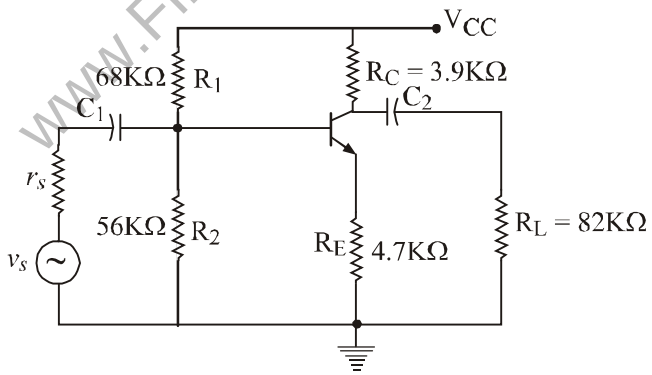

Figure.1

9. Discuss the working and applications of Class B push-pull amplifier. Derive the expression for max power delivered to the load. How the cross-over distortion can be eliminated?