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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 $V_{CEmax} = 0.5V$, $V_{CC} = 30V$, $R_L = 1.2k\Omega$.
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 : $h_{fe} = 75$, $h_{ie} = 2.1k\Omega$, $h_{oe} = 1\mu S$.

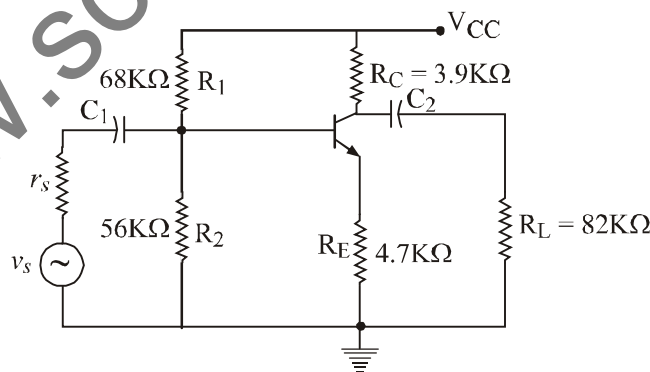


Figure.1

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?