30902

# THIRD SEMESTER B.TECH (ENGINEERING) DEGREE EXAMINATION, NOVEMBER 2012

## ELECTRICAL & ELECTRONICS ENGINEERING

### EE 09 305 – ANALOG ELECTRONICS (2009 Admissions)

Time : Three Hours                                    Maximum : 70 Marks

## PART A

*Answer all the questions. Each question carries 2 marks*

1. What is a clamping circuit. What is its use

2. What is meant by Gain roll off of an amplifier. Sketch a typical frequency response of a BJT amplifier

3. What is the concept of virtual ground in an OP- AMP.

4. Explain the concept of slew rate in an OP AMP

5. Sketch and write the function of the basic building blocks of a PLL.

$(5 * 2 = 10 marks)$

## PART B

*Answer any Four(4) questions. Each question carries 5 marks*

6. Explain the concept of load line of a diode circuit. Explain the procedure for drawing the load line.

7. What are the factors to be considered in cascading transistor amplifiers. What is the need of cascading.

8. Explain the high frequency response of an FET.

9. Draw and explain OP AMP summing amplifiers.

10. Why negative feedback is commonly employed in a transistor amplifier circuit. What are the impact of such a feedback

11. How a PLL can be used as a FM demodulator. Explain.

$(4 * 5 = 20 marks)$

## PART C

*Answer four(4) full questions. Each question carries 10 marks. Missing data may suitably be assumed.*

12. (a) With a neat circuit diagram and waveform, explain the working of a full wave diode rectifier. what is the ripple factor and rectification efficiency of this rectifier. Derive the values from fundamentals.

    (b) Compare the performance of class B and class AB power amplifiers.

$(6 + 4 = 10 marks)$

*OR*

(c) For a common-source amplifier, obtain a small signal model and derive its current gain, voltage gain, input impedance and output impedance

(d) Draw a clipper circuit with a zener diode and explain the circuit with waveform

$(7 + 3 = 10 marks)$

13. (a) What are the relevance of internal capacitance's of a a BJT. Discuss the high frequency model of a BJT with the internal capacitance's included.

(b) Explain Miller's theorem

$(6 + 4 = 10 marks)$

**OR**

(c) Explain two practical circuits in which feed back is employed.

(d) Compare the affect of positive feed back on the characteristics of a circuit

$(6 + 4 = 10 marks)$

14. (a) Stating the Bark hausen's criterion, explain the working of an oscillator. How a transistor amplifier can be converted as oscillator

(b) With a circuit diagram and waveform, explain the operation of an OP AMP integrator. What is the condition to be satisfied to get satisfactory integrator operation.

$(6 + 4 = 10 marks)$

**OR**

(c) Explain how a practical OP AMP differs from an ideal OP AMP. What are the reasons for deviations of characteristics from ideal to practical.

(d) Write about the internal compensation of OP-AMPs. What is the need for it.

$(5 + 5 = 10 marks)$

15. (a) Explain the operation of Butterwoth low pass filter. Explain the design procedure of a second order Butterworth low pass filter. Select the component values for an upper cut off frequency of 1MHz.

$(10 marks)$

**OR**

(b) Explain the functional diagram of timer IC 555. Explain monostable mode

(c) What is a zero crossing detector. How it is implemented.

$(6 + 4 = 10 marks)$