Reg. No._____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code**: EC205**

Course Name**: ELECTRONIC CIRCUITS (AE, EC)**

Max. Marks: 100 Duration: 3 Hours

PART A

Question No. 1 is compulsory.

1. a. Sketch the response of high pass circuit to a pulse input if $RC/t_p>>1$ and $RC/t_p<<1$ where t_p is the time period of input pulse (3)
   b. Explain the concept of DC load line of an amplifier. What is the significance of AC load line (3)
   c. Design an integrator for an input square wave of frequency 1 KHz? (2)
   d. Draw the hybrid π small signal low frequency model for CE configuration and derive the expression for input and output impedances (7)
2. a. What are the factors that affect low and high frequency response of a RC coupled amplifier? (6)
   b. How amplifiers are classified based on the position of operating point (4)
   c. What are the major factors that affect the stability of a transistor amplifier and how the stability factors are defined? (5)

OR

3. a. With a hybrid π small signal low frequency equivalent circuit derive the expression for Current and voltage gain of a CE transistor amplifier. (9)
   b. Compare the input and output impedance of CE,CB and CC amplifiers. (3)
   c. What is cascade amplifier? (3)

PART B

Question No.4 is compulsory.

4. a. Draw the small signal high frequency hybrid π model of a transistor in Common Emitter configuration and derive the expression for short-circuit current gain. (7)
   b. What is Barkhausen criterion for sustained oscillations? (2)
   c. Derive the expression for frequency and gain of a Wein bridge oscillator. (6)
5. a. Draw the circuit of a typical cascode connection and explain its main features. (8)
   b. Draw the short circuit current gain versus frequency plot on a log scale and mark f_β and f_T on the plot (3)
   c. What is meant by short circuit current gain-bandwidth product? (2)
   d. What is the significance of gain-bandwidth product? (2)

OR

OR

6. a. Draw the circuit of a RC phase shift oscillator and design the circuit for an output frequency of 10KHz. (7)
   b. Draw the circuit of a tuned amplifier and explain the working. (4)
   c. Draw the feedback amplifier topologies clearly indicating the currents, voltages, transfer gain and feedback factor. (4)

PART C

Question No. 7 is compulsory.

7. a Draw the circuit diagram of collector coupled astable multivibrator and explain its operation with neat waveforms (10)
   b. Draw the circuit of a series voltage regulator with error amplifier and explain the working (6)
   c. Suggest one scheme to incorporate short circuit protection in a series regulator (4)
8. a. Show the maximum efficiency of a class B power amplifier is 78.5%. (5)
   b. What is crossover distortion? How it can be eliminated? (3)
   c. Draw the circuit of a class AB power amplifier and explain the working. (6)
   d. Draw the circuit of a Schmitt trigger and explain the working (6)

OR

9. a. Design a series voltage regulator with error amplifier having the following specification Output voltage-5 voltsMaximum load current -100mA Input voltage range 7 – 12 volts (Make suitable assumptions) (10)
   b. With the help of low frequency and high frequency equivalent circuit derive the expression for voltage gain at low and high frequencies (10)