

**SREE VIDYANIKETHAN ENGINEERING COLLEGE**

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

**II B.Tech II Semester (SVEC-16) Regular Examinations May - 2018****ELECTRONIC CIRCUIT ANALYSIS AND DESIGN****[Electronics and Instrumentation Engineering]**

Time: 3 hours

Max. Marks: 70

**Answer One Question from each Unit****All questions carry equal marks****UNIT-I**

- 1 a) Calculate  $A_v$ ,  $A_i$ ,  $R_i$ ,  $R_o$  of CE amplifier with emitter resistance. CO3 7 Marks  
 b) Differentiate CE, CB and CC amplifiers. CO4 7 Marks

**(OR)**

- 2 a) Derive the expression for  $A_v$ ,  $A_i$ ,  $R_i$ ,  $R_o$  of Darlington amplifier. CO3 8 Marks  
 b) With neat diagram, explain the operation of CE-CB cascode configuration. CO1 6 Marks

**UNIT-II**

- 3 a) Derive the expression for  $A_v$ ,  $R_i$ ,  $R_o$  of common source amplifier at high frequencies. CO1 8 Marks  
 b) Draw the hybrid  $\pi$  model and explain the capacitance  $C_{b'e}$  and  $C_{b'c}$ . CO2 6 Marks

**(OR)**

- 4 a) Derive the expression for CE short circuit current gain. CO3 8 Marks  
 b) A BJT has  $g_m = 38\text{mhos}$ ,  $r_{b'e} = 5.9\text{k}\Omega$ ,  $h_{ie} = 6\text{k}\Omega$ ,  $r_{bb'} = 100\Omega$ ,  $C_{b'e} = 12\text{pF}$ ,  $C_{b'c} = 63\text{pF}$  and  $h_{fe} = 224$  at  $1\text{kHz}$ . Calculate  $\alpha$  and  $\beta$  cut-off frequencies and  $f_T$ . CO4 6 Marks

**UNIT-III**

- 5 a) Draw the block diagram of current shunt feedback amplifier and derive the expression for input and output impedance. CO2 8 Marks  
 b) A voltage series negative feedback amplifier has a voltage gain without feedback of  $A=500$ , input resistance  $R_i = 3\text{k}\Omega$ , output resistance  $R_o = 20\text{k}\Omega$  and feedback ratio  $\beta = 0.01$ . Calculate the voltage gain  $A_f$ , input resistance  $R_{if}$  and output resistance  $R_{of}$  of the amplifier with feedback. CO4 6 Marks

**(OR)**

- 6 a) Derive the expression for frequency of oscillations in Colpitts oscillator and conditions for oscillations with circuit diagram. CO3 10 Marks  
 b) In the Wein-bridge oscillator if the RC network consists of resistors of  $200\text{k}\Omega$  and the capacitors of  $300\text{pF}$ , find the frequency of oscillation. CO4 4 Marks

**UNIT-IV**

- 7 a) Compare series fed and transformer coupled class-A power amplifiers. CO4 6 Marks  
 b) Analyze the working of transformer coupled class-A power amplifier and derive the equation for efficiency. CO6 8 Marks

**(OR)**

- 8 a) Explain the working of transformer coupled class-B push-pull power amplifier and derive the equation for efficiency. CO5 10 Marks  
 b) A power amplifier supplies  $3\text{W}$  to a load of  $6\Omega$ . The zero-signal d.c collectors is  $55\text{mA}$  and the collector current with signal is  $60\text{mA}$ . CO6 4 Marks

**UNIT-V**

- 9 a) Draw and explain the working of single tuned amplifier. CO4 9 Marks  
 b) Derive the expression for bandwidth of cascaded n stages single tuned amplifiers. CO5 5 Marks

**(OR)**

- 10 Write short notes on i) Stability of tuned amplifiers CO2 14 Marks  
 ii) Class-C tuned amplifier

