**Reg. No. :** | | | | | | | | | | |

**Question Paper Code: 31344**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Third Semester

Electronics and Communication Engineering

01UEC304 - ELECTRONIC CIRCUITS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What are the factors affecting the stability of Q point?
2. Define thermal runaway? How to minimize that effect?
3. Describe the effect of emitter bypass capacitor on CE amplifier.
4. Draw the circuit of emitter coupled amplifier using BJT.
5. The output of RC coupled amplifier circuit RC=10$k\Omega$, C3=0.1$\mu F$, RL=10$k\Omega$. Determine the critical frequency.
6. A certain transistor has an unit gain frequency $f_T$ of 175$MHz$. when this transistor is used in an amplifier with a midrange voltage gain of 50, what bandwidth can be achieved ideally?
7. Write the relation between rise time and bandwidth.
8. What is class S operation?
9. How negative feedback causes reduction in noise in amplifiers?
10. Discover the applications of class c tuned amplifiers.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) With neat diagram and needed expression, explain the working principles of self bias of transistor. (8)

(ii) Calculate the value of base current, collector current and collector-emitter voltage for a fixed bias circuit using NPN transistor. The circuit has Vcc=25*V*; Rc=820Ω; $R_B$=180 *k*Ω; β=80. (8)

Or

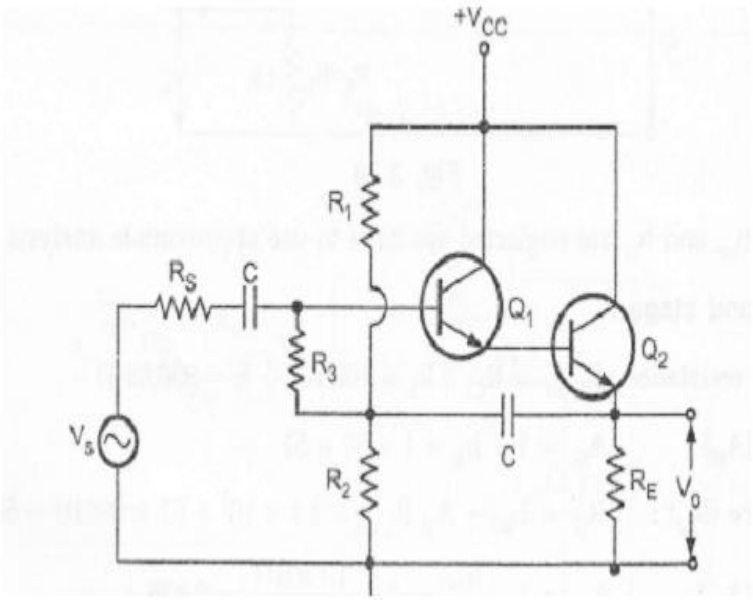
(b) (i) What is stability? What is the need for load line and Q point calculation? (8)

(ii) With neat diagram, explain biasing circuit for EMOSFET. (8)

12. (a) Draw the hybrid model of CE amplifier and obtain its, gain, input and output impedance. Compare the performance of this CE amplifier with CB and CC configuration. (16)

Or

(b) Analyze the following circuit for the following values of resistors and h-parameters $R_S$=10K; $R_1$=100 kΩ; $R_2$=10 kΩ, $R_3$=50 kΩ; $R_E$=1 kΩ; $h_{ie}$ =1 kΩ; $h_{fe}$ =100; $h_{re}$ =2.4×$10^{-4}$ , $h_{oe}$ =2.5×$10^{-5}$ *A/V*. (16)



13. (a) (i) A transistor has $f_\alpha = 8\ MHz$ and $\beta = 80$. When connected as an amplifier it has stray capacitance of $100Pf$ at the output terminal. Calculate its upper 3 *db* frequency when $R_L$ is $10K$. (6)

(ii) Sketch the hybrid $\pi$ model of a transistor and explain the function of each parameter in model. (10)

Or

(b) Derive the expression for over all lower and higher cutoff frequency of multistage amplifier. Both stages in a certain 2-stage amplifier have a lower critical frequency of $500Hz$ and an upper critical frequency of 80 *kHz*. Determine the overall bandwidth. (16)

14. (a) (i) Write short notes on MOSFET power amplifier. (8)

(ii) For the class-A, CE amplifier $Vcc=20v$, $R_C=20\Omega$, $V_{CEQ}=10V$ *and* $I_{CQ}= 500mA$, output current varies ± $250mA$ when input signal applied at the base compute overall efficiency. (8)

Or

(b) (i) Draw and explain the working of Complementary symmetry push pull class B amplifier. (8)

(ii) Explain various types of distortions in amplifiers. (8)

15. (a) Draw the block diagram of current series feedback amplifiers and derive the expressions of input and output impedance. (16)

Or

(b) (i) Draw and explain the working of class C tuned amplifiers. (8)

(ii) Discuss Nyquist criterion for stability of feedback amplifiers. (8)

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