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

Question Paper Code : 53404

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Third Semester

Electronics and Communication Engineering

15UEC304-ELECTRONIC CIRCUITS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. When a BJT is used as an amplifier, it operates in CO1- R

   (a) Active region (b) Cutoff region (c) Saturation region (d) All the above

2. The darlington pair consists of the following two stages CO2- App

   (a) CE and CC (b) Both CE (c) both CC (d) CE and CB

3. The cutoff frequency that occurs when the common emitter current gain value drops to 0.707 of its low frequency value is called as CO3- U

   (a) Alpha frequency (b) Beta frequency (c) Gamma frequency (d) Bandwidth

4. Class AB operation is often used in power amplifiers in order to CO4-R

   (a) Get maximum efficiency (b) remove even harmonics

   (c) Overcome cross-over distortion (d) reduce collector dissipation

5. In a Common emitter amplifier, the un-bypassed emitter resistor provides CO5- R

   (a) voltage-shunt feedback (b) current-series feedback

   (c) negative-voltage feedback (d) positive-current feedback

PART – B (5 x 3= 15Marks)

6. Define: Stability factor. CO1-R
7. State Miller's theorem. CO2-U
8. Sketch the frequency response of an amplifier with a bypassed emitter resistor. CO3-App
9. What is mean by second order harmonic distortion? CO4-U

10. An amplifier has a mid-band gain of 125 and a bandwidth of 250kHz. Calculate the new bandwidth and gain, if 4% of negative feedback is introduced. CO5- R

PART – C (5 x 16= 80Marks)

11. (a) Design the CE amplifier circuit with fixed bias configuration and explain it in detail. CO1-App (16)

Or

(b) Discuss the various techniques of stabilization of Q-point in a transistor. CO1- U (16)

12. (a) Draw the small signal equivalent model of a CE amplifier circuit and analyze the circuit to obtain the various parameters. CO2- U (16)

Or

(b) Draw the circuit of an emitter coupled differential amplifier and explain its operation. Analyze the circuit and obtain its transfer characteristics. CO2- U (16)

13. (a) Analyze the high frequency equivalent circuit of a FET amplifier. CO3-U (16)

Or

(b) Find the Midband gain A_m and upper 3dB frequency f_h of CS amplifier fed with a signal source having an internal resistance R_{sig}=100 KΩ. The amplifier has R_G = 4.7MΩ, R_D = R_L = 15KΩ, g_m = 1mA/V, r_0 = 150KΩ, C_{gs} = 1pF and C_{gd} = 0.4 pF. CO3-App (16)

14. (a) Derive an expression for the theoretical maximum conversion efficiency of class B power amplifier. Also distinguish between class A, class B and class C amplifiers. CO4 U (16)

Or

(b) Draw the circuit diagram and explain the operation of class B push pull amplifier. Also discuss its merits. CO4 U (16)

15. (a) State and explain Nyquist criterion for stability in feedback amplifier. Also Obtain the frequency response of a current series feedback amplifier and explain the same. CO5- U (16)

Or

(b) Discuss and analyze the working of a single-tuned amplifier and draw a gain versus frequency plot. CO5- U (16)