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

Question Paper Code: U3405

B.E./B.Tech. DEGREE EXAMINATION, NOV 2022

Third Semester

Electronics and Communication Engineering

21UEC305 – ELECTRONICS CIRCUITS

(Regulation 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The properly biased, JFET will act as a CO1- U

   (a) Current controlled current source (b) Voltage controlled voltage source

   (c) Voltage controlled current source (d) Current controlled voltage source

2. The voltage gain of an amplifier decreases at 20dB/octave above 100KHz. If the mid frequency gain is 80dB. What is the value of voltage gain at 2MHz CO4- App

   (a) 60dB (b) 52dB (c) 54dB (d) 64dB

3. For a transistor TJ=160^{o}C,TA=40^{o}C and θ_J-A=80^{o}C/W.Calculate the power that the transistor can safely dissipate in free air. CO2- App

   (a) 2.3W (b) 5.8W (c) 4.0W (d) 1.5W

4. To obtain very high input and O/P impedance in a feedback amplifier, the type of feedback utilized CO1- U

   (a) voltage series (b) current series (c) voltage shunt (d) current shunt

5. Which of the following oscillators is (are) tuned oscillators? CO1- U

   (a) colpitts (b) Hartley (c) crystal (d) all of the above

PART – B (5 x 3= 15 Marks)

6. Define current amplification factor. Write its expression for various configuration CO1- U

7. Draw the frequency response curve of BJT small signal amplifier and indicate various parts. CO1- U

8. Compare Push Pull and Complementary Symmetry Class B amplifiers. CO1- U

9. Define sensitivity and desensitivity of gain in feedback amplifiers. CO1- U

10. Why in practice A β is kept greater than unity. CO1- U

PART – C (5 x 16= 80Marks)

11. (a) Calculate A_i, R_i, A_v, A_{is}, power gain and R_o for a single stage CE amplifier with R_s = 1KΩ, R_L = 1.2KΩ. ifh_{ie} = 1.1k, h_{re} = $2.5*10^{-4}$, h_{fe} = 50 and hoe = 25μA/V. CO2- App (16)

Or

(b) Derive necessary expressions and analyze Voltage gain(A_v), Current Gain(A_i),Input Impedance(Z_i), output admittance($Y_{o)}$ from small signal model of BJT using H-parameters for CC configurations of BJT. CO2- App (16)

12. (a) Determine the frequency of various RC networks comprised in BJT amplifier under low frequency condition. CO2-App (16)

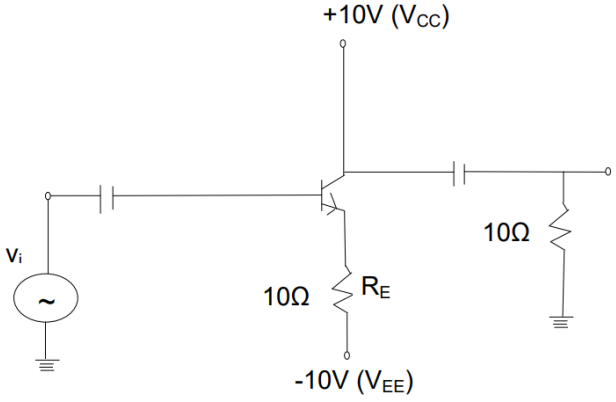
Or

(b) Analyze the frequency response of multistage amplifier in detail with necessary quantitative analysis. CO2- App (16)

13. (a) Explain the operation of class B power amplifier circuit using power transistor and calculate its maximum efficiency. CO1- U (16)

Or

(b) Calculate maximum ac output power and efficiency of the amplifier shown in fig. VBE may be assumed negligibly small. CO2- App (16)



14. (a) Draw the circuit of voltage series feedback amplifier and derive the expression for input resistance and output impedance. CO1-U (16)

Or

(b) When negative voltage feedback is applied to an amplifier of gain 100, the overall gain falls to 50. CO2-App (16)
(i) Calculate the fraction of the output voltage feedback.
(ii) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 75.

15. (a) Explain Hartley oscillator and derive the equation for oscillation? CO1-U (16)

Or

(b) A Hartley Oscillator circuit having two individual inductors of 0.5mH each, are designed to resonate in parallel with a variable capacitor that can be adjusted between 100pF and 500pF. Determine the upper and lower frequencies of oscillation and also the Hartley oscillators bandwidth. CO2-App (16)