



R17 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 1P3DB

B.Tech II Year I Semester Supplementary Examinations, July 2022
ANALOG ELECTRONICS

ECE

Maximum Marks: 70

Date: 21.07.2022 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Discuss various possibilities of inter-stage coupling of amplifiers.
- 2 Draw a small signal low frequency model of a transistor.
- 3 Draw simplified high frequency model of CE amplifier.
- 4 Define $f_{\beta T}$ and f_{α} .
- 5 Comparison of performance with BJT & JFET Amplifiers.
- 6 Draw the frequency response of CS amplifier with resistive load.
- 7 What is the effect of negative feedback on amplifier gain.
- 8 State the frequency for RC phase shift oscillator.
- 9 State different types of heat sinks.
- 10 Calculate the power that can be dissipated by a transistor at an ambient temperature of $T_A=500C$, given $T_j=2300C$ and $\theta_{JA}=1000C/W$.

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 a) Draw the circuit diagram of a common collector amplifier along with its equivalent circuit. Derive expressions for A_V, R_i, A_1 and R_o .
b) What is non-linear distortion? List the causes for this type of distortion in amplifiers.
[7+3]

OR

- 12 Draw the circuit for Cascode Amplifier. Explain its working, obtaining overall values of the circuit in terms of h-parameters. [10]
- 13 (a) Obtain an expression for CE short circuit current gain.
(b) The CE short circuit current gain of transistor is 25 at a frequency of 2MHz, if $f_{\beta}=200\text{kHz}$. Calculate (i) f_T (ii) h_{fe} (iii) $|A_v|$ at a frequency of 10MHz. [5+5]
- OR
- 14 (a) Give the typical values of various Hybrid- π parameters.
(b) Derive the expression of gain bandwidth product for current. [4+6]
- 15 Explain the Analysis of CG JFET Amplifier. [10]
- OR
- 16 Draw the circuit diagram of common source amplifier with Diode connected load? Explain its operation. [10]
- 17 Discuss quantitatively about the effect of negative feedback on i) Gain ii) Bandwidth iii) Input Impedance iv) Distortion v) Noise
- OR
- 18 Explain and derive the expression for the frequency of Hartely oscillators. [10]
- 19 Derive the expressions for maximum. Theoretical efficiency 'for
(i) Transformer coupled
(ii) Series fed amplifier what are their advantages and disadvantages. [5+5]
- OR
- 20 Draw the circuit and explain the working principle of a complementary symmetry push-pull power amplifier and state its disadvantages? [10]