



R18 Regulation

Subject code: 2P3DC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, March/April 2023

ANALOG ELECTRONIC CIRCUIT ANALYSIS (Electronics and Communication Engineering)

Maximum Marks: 70

Date:01.04.2023 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 which carries 10M.
 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 What are the main characteristics of a Darlington amplifier?
- 2 What is cascading and write the advantages
- 3 Define f_{β} .
- 4 Draw simplified high frequency model of CE amplifier.
- 5 Compare CS, CG, CD amplifiers.
- 6 Draw the small signal model of a MOS Amplifier.
- 7 Mention Barkhausen Criteria.
- 8 What is the effect of negative feedback on amplifier gain.
- 9 List the applications of Tuned Amplifier
- 10 Classify different types of heat sinks.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 A transistor in CB circuit has the following set of h-parameters $h_{ib}=20 \Omega$, $h_{fb}=0.98$, $h_{rb}=3 \times 10^{-4}$, $h_{ob}=0.5 \times 10^{-6} \Omega$. Find the values of R_i , R_o , A_v and A_i if $R_L=1.5k\Omega$, $R_s=600 \Omega$. [10M]
OR
- 12 A. Derive an expression for the lower 3dB frequency of an RC coupled amplifier by taking the effect Coupling capacitor into account. [10M]
- 13 A. Derive the expressions for f_{β} and f_T . [4M]
B. The CE short circuit current gain of transistor is 25 at a frequency of 2MHz, if $f_{\beta}=200kHz$. Calculate (i) f_T (ii) h_{fe} (iii) $|A_i|$ at a frequency of 10MHz. [6M]
OR
- 14 Draw the hybrid- π model, explain and derive the conductance and capacitances. [10M]
- 15 A. Derive expressions A_i , A_v , R_i for source follower circuit using CD FET. [6M]
B. Define various regions of MOSFET characteristic curve [4M]
OR
- 16 A. Give brief discussion about cascode and folded cascode amplifier using MOS FET. [4M]

B. Draw the CS FET amplifier equivalent circuit looking into the drain and find its gain, input impedance and output impedance. [6M]

17 Explain and show that the gain of Wein bridge oscillator using BJT amplifier must be at least 3 for the oscillations to occur. [10M]

OR

18 Derive the expression for A_v, Z_i, Z_o and A_i for voltage series feedback amplifier. [10M]

19 Derive the general expression for the output power in the case of a class A power amplifier. Draw the circuit and explain the movement of operating point on the load line for a given input signal. [10M]

OR

20 A. Derive expression of bandwidth which for single tuned amplifier [5M]
B. Draw the circuit and explain the working principle of a complementary symmetry power amplifier and state its disadvantages? [5M]