



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, March/April 2023**  
**ANALOG ELECTRONICS**  
(ECE)

Maximum Marks: 70

Date:29.03.2023 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.  
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 In which region BJT act as Switch and Amplifier.
- 2 What are the main characteristics of a Darlington amplifier?
- 3 Define logarithm and db.
- 4 Define a short circuit Gain of a transistor in CE configurations at high frequencies.
- 5 Draw the small signal model of JFET.
- 6 Write the applications of MOSFET?
- 7 What are the conditions for sustained oscillator or what is Barkhausen criterion.
- 8 Define sensitivity in feedback amplifiers.
- 9 What is thermal runaway?
- 10 Differentiate power amplifier with that of a normal small signal amplifier in the aspects of its construction and applications.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Write the analysis of a CE amplifier circuit using h parameters. Derive the expressions for  $A_i$ ,  $R_i$ ,  $A_v$  &  $R_o$ . [10]
- OR
- 12 Derive expressions for overall voltage gain and overall current gain of a two-stage RC coupled amplifier. [10]
- 13 Derive the expression for the CE short-circuits current gain  $A_i$  with resistive load. [10]
- OR
- 14 Draw the high frequency equivalent circuit of a BJT and explain the same. [10]
- 15 Derive the expression for voltage gain of common source MOS amplifier with resistive load. [10]
- OR
- 16 Explain the Analysis of CD JFET Amplifier. [10]

- 17 Give the equivalent circuits, and characteristics of ideal and practical amplifiers of the following types (i) Voltage amplifier, (ii) Current amplifiers, (iii) Trans-resistance amplifier, (iv) Trans-conductance amplifier. [10]

OR

- 18 Draw the circuit and explain the principle of operation of RC phase-shift oscillator circuit. What is the frequency range of generation of oscillations? Derive the expression for the frequency of oscillations. [10]
- 19 Derive the expression for Max. theoretical efficiency in the case of class B push pull amplifier. [10]

OR

- 20 What is the Stagger tuned amplifier and explain its advantages? [10]