



Regulation R18

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2P3DC

B.Tech III Semester Regular/Supplementary Examinations, February 2021

ANALOG ELECTRONIC CIRCUIT ANALYSIS
(Electronics and Communication Engineering)

Maximum Marks: 70

Date: 22.02.2021 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 Mention the effect of coupling capacitors on the bandwidth of the amplifier.
- 2 List the features of Darlington pair amplifier.
- 3 Write the general frequency considerations of an amplifier.
- 4 Why CE amplifier is generally preferable?
- 5 Draw the high frequency equivalent circuit of FETs
- 6 Draw the small signal model of a MOSFET considering second order effects.
- 7 What are the advantages and disadvantages of negative feedback.
- 8 What is Barkhausen Criteria.
- 9 What is a harmonic distortion? How even harmonics is eliminated using push-pull circuit?
- 10 Define Q-factor.

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11.a Define h-parameter of a transistor in a small signal amplifier. What are the benefits of h-parameters? 5M
- 11.b Explain about different types of distortions that occur in amplifier circuits. 5M

OR

12. A darlington emitter follower circuit uses two identical transistor having the following h parameters $h_{ie}=1.1K$, $h_{re}=2.2*10^{-4}$, $h_{fe}=50$, $h_{oe}=20\mu V/A$, $R_{E2}=3K\Omega$, $R_S=400\Omega$, $R_1=90K\Omega$, $R_2=10K\Omega$ Compute overall A_I & A_V , R_i , R_o & R_{ot} 10M
- 13.a Explain in detail with neat diagram frequency response of BJT amplifier. Discuss the significance of cut off frequencies and Bandwidth of the amplifier. 8M
- 13.b Write the expression of gain bandwidth product for voltage 2M

OR

14. Obtain an expression for CE short circuit current gain. 10M
- 15.a Explain the operation of common source FET amplifier with neat diagram. Derive the expression for voltage gain 5M
- 15.b Draw the circuit for Cascode Amplifier. Explain its working, obtaining overall values of the circuit in terms of h-parameters. 5M
- OR
- 16.a A common source amplifier uses a MOSFET with the following parameters $g_m=1.5\text{mA/V}$, $r_d=40\text{kohms}$, $C_{gs}=3\text{pF}$, $C_{ds}=1\text{pF}$, $C_{gd}=3.2\text{pF}$. The value of $R_d=200\text{Kohms}$. The amplifier operates at 30KHz. Find Voltage gain, input resistance, output resistance and input capacitance 8M
- 16.b Differentiate between cascode and folded cascode configurations. 2M
17. Explain different negative feedback topologies with neat diagrams 10M
- OR
18. Draw the circuit diagram and derive the expression for frequency of oscillation and condition for sustained oscillations of 5M
i) Colpitts oscillator 5M
ii) Hartley Oscillator
- 19 In a class B complementary power amplifier $V_{cc}=+15\text{V}$, $-V_{cc}=15\text{V}$ and $R_L=4\Omega$. Calculate 10M
(i) Maximum a.c power which can be developed
(ii) Collector dissipation while developing maximum a.c power
(iii) Efficiency
(iv) Maximum power dissipation per transistor
- OR
- 20 Draw the circuit for Single Tuned Amplifier. Explain its working. 10M