



B. Tech III Semester Regular Examinations, February 2022
ELECTRIC CIRCUIT ANALYSIS
(ELECTRONICS & COMMUNICATION ENGINEERING)

Maximum Marks: 70

Date: 23.02.2022 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 How to construct the small signal AC equivalent circuit of the BJT
- 2 Compare cascade and cascode amplifier.
- 3 Define bypass and coupling Capacitor.
- 4 State Millers Theorem
- 5 Write down the small signal parameters of JFET.
- 6 List the advantages of common drain amplifier.
- 7 Discuss the effect of bandwidth in a negative feedback amplifier.
- 8 What is Barkhausen Criterion
- 9 A tuned amplifier has its maximum gain at a frequency of 2 MHz and has a bandwidth of 50 KHz. Calculate the Q factor.
- 10 List out the classifications of power amplifiers.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Construct the Darlington pair circuit and explain its operation and advantages and also derive its small signal voltage gain and input impedance. 10M
- OR
- 12 Derive the gain, input and output resistance of common emitter amplifier with a neat circuit diagram and equivalent circuit. 10M
- 13 Derive the expression for CE short circuit current gain? 10M
- OR
- 14 Derive the parameters of $g_{b'e}$, $C_{b'c}$ of a hybrid π model equivalent circuit. 10M
- 15 Derive gain, input and output impedance of common source JFET amplifier with neat circuit diagram and equivalent circuit. 10M
- OR
- 16 Derive the gain, input and output impedance of MOSFET source follower with neat circuit diagram and equivalent circuit. 10M

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- 17 Discuss the effects of negative feedback on stability, distortion, noise, input and output impedance of a feedback amplifier. 10M
- OR
- 18 Explain the working of a Hartley oscillator with a neat circuit diagram and derive the frequency of oscillation. 10M
- 19 Write about the Class B transformer coupled power amplifier with necessary derivations. 10M
- OR
- 20 Explain the single tuned amplifier and derive the expressions for gain, resonant frequency and cutoff frequencies. 10M