**Code No: 124CV** **R15**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**B.Tech II Year II Semester Examinations, April - 2018**
**ELECTRONIC CIRCUIT ANALYSIS**
**(Common to ECE, EIE, ETM)**

**Time: 3 Hours** **Max. Marks: 75**

**Note:** This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

**PART- A**

**(25 Marks)**

| | | |
|---|---|---|
| 1.a) | Draw the circuit diagram of Darlington Pair. | [2] |
| b) | What is the expression for harmonic distortion in single stage amplifiers? | [3] |
| c) | Define Gain-Bandwidth Product in detail. | [2] |
| d) | Draw the Small signal model of MOS amplifier. | [3] |
| e) | List out the Conditions for Oscillations in detail. | [2] |
| f) | Explain different Classification of Feedback Amplifiers. | [3] |
| g) | Define Thermal Stability and Thermal Runway. | [2] |
| h) | What is Heat sink and explain its advantages? | [3] |
| i) | Define Q factor. | [2] |
| j) | What is the expression for harmonic distortion in tuned amplifiers? | [3] |

**PART-B**

**(50 Marks)**

2.a) Discuss about effect of Cb on frequency response of RC coupled amplifier.
b) Draw the circuit diagram of Direct Coupled Amplifier and explain its operation in detail. [5+5]

**OR**

3.a) With a neat circuit diagram. Explain about Boo-Strap emitter follower amplifier.
b) Derive the Analysis of CE amplifier with Emitter Resistance and explain its operation along with circuit diagram. [5+5]

4.a) Find the voltage gain, input and output resistances of a emitter follower at high Frequencies.
b) A common source amplifier uses a MOSFET with the following parameters gm=1.5mA/V, rd=40kohms, Cgs=3pF, Cds=1pF, Cgd=3.2pF. The value of Rd=200Kohms. The amplifier operates at 30KHz. Find Voltage gain, input resistance, output resistance and input capacitance. [5+5]

**OR**

5.a) Draw the circuit diagram of Common source amplifier with Resistive load and explain its operation.
b) Derive the expression for $f_T$ of a transistor in detail. [5+5]

6.a) Derive the expression for frequency of oscillation of BJT RC phase-shift oscillator with necessary explanation.

b) What is the equivalent circuit of a crystal? Derive the expressions for series and parallel resonances. A crystal oscillator has the following parameters: L=0.33H, C=0.065pF, Cm=1.0pF and R=5.5 k ohm.
i) Find the series resonant frequency.
ii) Find the Q of the crystal. [5+5]

**OR**

7.a) Draw the block diagrams of four types of negative feedback amplifier circuits and explain the advantages and disadvantages with necessary derivations.

b) Explain why RC Phase shift oscillators are not used at high frequencies. [5+5]

8.a) Explain the operation of a class A push-pull power amplifier and list out its advantages and disadvantages.

b) A single transistor is operating as an ideal class B amplifier with a 10-K load. A dc meter in the collector circuit reads 8mA. How much signal power is delivered to the load? [5+5]

**OR**

9.a) Draw the circuit diagram of Complementary Symmetry Class B Push-Pull Amplifier and explain its operation.

b) List out the few difference between Class A, Class B and Class AB Push-Pull amplifiers with examples. [5+5]

10.a) What is a stagger tuned amplifier? Explain its advantages and disadvantages.

b) Write short notes on Small Signal Tuned Amplifiers in detail. [5+5]

**OR**

11.a) What are the different Effect of Cascading Single Tuned Amplifiers on Bandwidth in detail.

b) Explain the concept of Stability of Tuned Amplifiers with one example. [5+5]

**---ooOoo---**