Code No: 124CV **R15**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, December - 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) How the amplifiers are classified? [2]
b) State and prove Miller's theorem. [3]
c) What is gain bandwidth product? [2]
d) Why emitter bypass capacitor is needed? [3]
e) How the stability of amplifier will affect by negative feedback amplifier? [2]
f) State the necessary conditions for oscillator. [3]
g) Define conversion efficiency of power amplifiers. [2]
h) How is crossover distortion eliminated in class AB amplifier? [3]
i) What are the applications of tuned amplifier? [2]
j) What is the coefficient coupling in a double tuned amplifier? [3]

PART-B

(50 Marks)

2.a) Draw the equivalent circuit for the CE and CC configurations subject to the restriction that $R_L = 0$. Show that the input impedance of the two circuits are identical.
b) The transistor amplifier shown in figure 1 uses a transistor with typical h parameter values. Calculate A_i, A_V, A_{Vs}, R_o and R_i. [5+5]

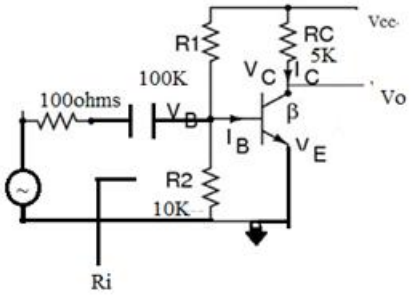

Figure: 1

OR

3.a) Draw the circuit diagram of Darlington emitter follower and derive the expression for input impedance.
b) Explain the working of cascade amplifier with neat circuit diagram. [5+5]

4.a) Draw the hybrid π equivalent circuit of a transistor in CE configuration and explain the various parameters in it.

b) A transistor biased at 5mA, 10V, h_{ie} =600Ω, h_{fe}=100, C_C=3pF and current gain of 10 at a frequency of 20MHz. Find β cut off frequency, gain band width product, C_e, $r_{b'e}$ and $r_{bb'}$ [5+5]

OR

5.a) Calculate the voltage gain of the FET amplifier shown in the figure 2. Assuming blocking capacitor to be large.g_m=4mA/V and r_d =5K.

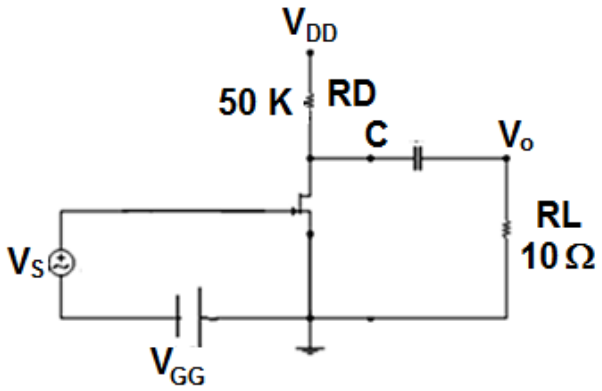

Figure: 2

b) Sketch the small signal model of a CD FET amplifier and derive equation for the voltage gain. [5+5]

6.a) Draw the negative feedback topologies and explain them.

b) An open loop amplifier has a midband gain of 500 and a pass band from 50Hz to 50KHz. Find voltage gain and cut off frequencies if 10% of output voltage is fed back. [5+5]

OR

7. Derive an expression for frequency of oscillations of a wien bridge oscillator using transistor. [10]

8.a) Explain how the efficiency of the class A power amplifier is improved by the transformer coupled amplifier configuration?

b) A transformer coupled class A power amplifier supplies the power to an 80Ω load connected across the secondary of a transformer having turns ration of 5:1. If I_c =120mA, find maximum output power? [6+4]

OR

9.a) Derive an equation of output power of a class B power amplifer.

b) Draw the circuit diagram of complementary symmetry class B pushpull amplifier and explain its working. [5+5]

10.a) Why is double tuning employed in tuned amplifier? What are the advantages of it?

b) What are applications of stagger tuned amplifier? [5+5]

OR

11.a) What are the high frequency limitations of a tuned amplifier? How are they eliminated?

b) How is the bandwidth of tuned amplifier improved? Draw such a circuit and explain its working. [5+5]

---ooOoo---