USN					

17EE34

Model Question Paper
Third Semester B.E Degree(CBCS) Examination
Analog Electronic circuits

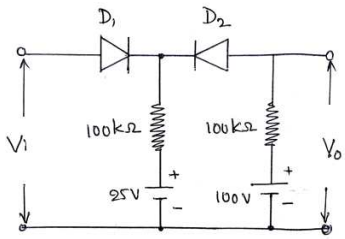
Time : 3hrs Max Marks:100

Note: *Answer* FIVE *full questions,choosing one full question from each module*

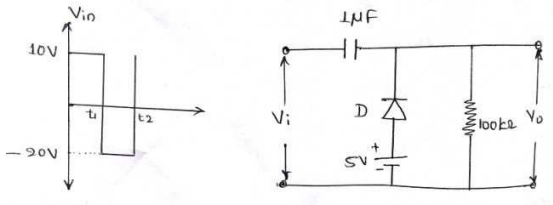
Module 1

1 a Draw a double ended clipper circuit and explain its working principle with transfer characteristics. **7 Marks**

b For the sketch shown fig. below, Vi varies from 0 to 150 V, sketch the output voltage Vo to the same time scale as the input voltage. Assume ideal diode **7 Marks**



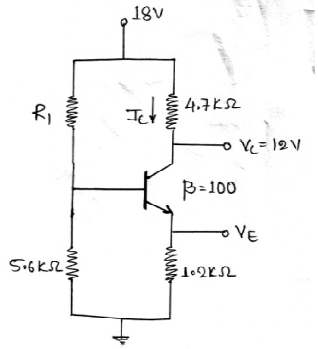
c Write the procedure for analyzing the clamping circuit, determine output voltage for the network shown in fig. (1.b) Assume f=1000Hz and ideal diode. **6 Marks**



or

2 a Consider a fixed bias circuit of a transistor. Obtain expressions for stability factor S_{ICO}, S_{VBE} and S_β. Draw the circuit diagram **9 Marks**

b For the circuit shown in fig. find I_C, V_B, V_E, R_1 and S_{ICO} **7 Marks**



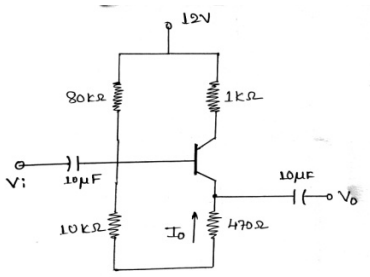
c Define operating point. Explain its significance **4 Marks**

Module 2

3 a Obtain r- parameter model for CE configuration. **5 Marks**

b Draw the circuit of common base amplifier. Derive the expression for current gain, voltage gain, input and output impedance using the model **7 Marks**

c For the emitter follower circuit shown in fig. obtain the values of r_e, Z_i, Z_o, voltage gain(A_V) and current gain (A_I). assume β=100 and r_o= 50kΩ **8 Marks**



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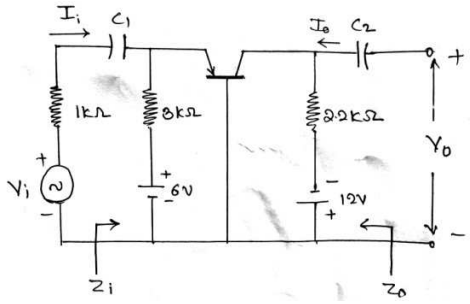
4 a Define h parameters and hence derive h-parameter model of CC-BJT **6 Marks**

b State and prove miller's theorem **6 Marks**

c For common base amplifier shown in fig. determine Z_i, A_I, A_V, and Z_O using complete hybrid equivalent model. (Given h_{ie}=1.6kΩ, h_{fe}=100, h_{re}=2 x 10^{-4}, h_{oe}=20μS.) **8 Marks**

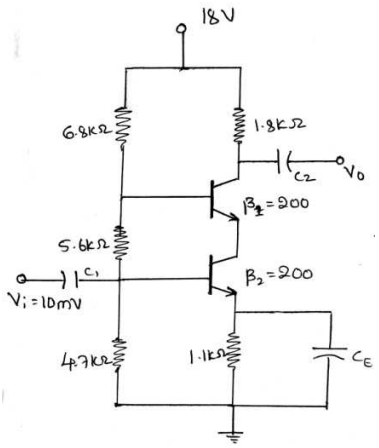


Module 3

5 a Draw the circuit of Darlington emitter follower. Derive the expression for current gain, voltage gain, input and output impedance using the model. **10Marks**

b For the cascode circuit shown below calculate **10 Marks**

a) The dc bias voltages V_{B1},V_{B2},V_{C2}
b) The no load voltage gain and the output voltages V_{O2}=V_O
c) The voltage gain with load of 10kΩ connected to the second stage and the output voltage V_O
d) Input and output impedances



or

6 a For the voltage series feedback amplifier topology, obtain expression for A_V and R_{if}. Also explain the principle of voltage amplifier used in feedback amplifiers. **10 Marks**

b List and explain the advantages of employing negative feedback in amplifiers **6 Marks**

c Explain the difference between cascade and cascode connections and its applications **4 Marks**

Module 4

7 a With a neat diagram explain transformer coupled power amplifier and derive the expression for AC power delivered to the load, show that the maximum efficiency is 50%. **10 Marks**

b State and explain Barkhausen criterion for sustained oscillations. **5 Marks**

c A crystal has following parameters: **5 Marks**
L=0.334H, C= 0.065pF, CM=1pF, R=5.5kΩ
Calculate series resonant frequency.
Calculate parallel resonant frequency.

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Find Q of the crystal.

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8 a Explain the working of complementary symmetry class B amplifier **6 Marks**

b Derive an expression for frequency of oscillations in wien bridge oscillator **8 Marks**

c Find the values of R_C, R. R' and C for an RC –phase shift oscillator for a frequency of oscillation of 1000 Hz. A transistor is having h_{fe}=200 and h_{ie}=2kΩ. **6 Marks**

Module 5

9 a Draw the circuit for JFET common source amplifier using fixed biased configuration and determine its input impedance, output impedance and voltage gain using ac equivalent small signal model **10 Marks**

b Explain the working and construction of JFET in detail and draw its transfer characteristics and drain characteristics. **10 Marks**

or

10 a Explain the depletion and enhancement type MOSFETs, their characteristics and frequency response **10 Marks**

b For the circuit shown in fig. **10 Marks**

a) Calculate Z_i and Z_o
b) Calculate A_V
c) Calculate V_O, for V_i=1mV(rms)
d) Repeat from (a) to (c) neglecting the effect of r_d10

(Given I_{DSS}=12mA, V_P=-3.5V, V_{GSQ}= -0.75V, r_d=50kΩ)