

F.E. (Semester - II) (RC) Examination, Nov. - 2011
BASIC ELECTRONIC ENGINEERING
(Revised in 2007-08)

Duration : 3 Hours

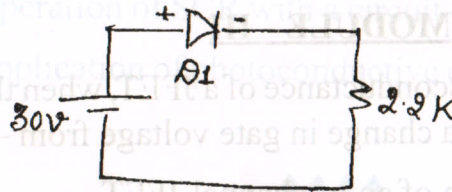
Total Marks : 100

Instructions: 1) Attempt five questions choosing at least one from each Module.
 2) Assume any additional data, if required.

MODULE - I



Q1) a) Using the approximate characteristics for a silicon diode, calculate V_D , I_D & V_R for the circuit shown. [6]

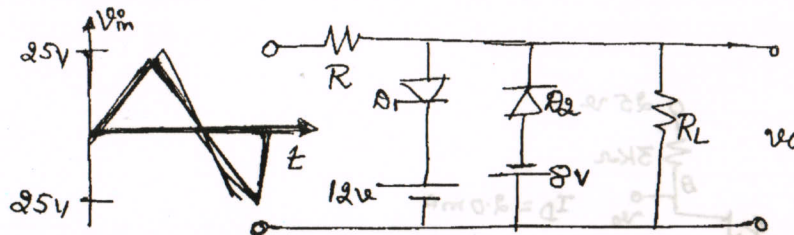


b) Explain the following terms in context with a semiconductor diode. [6]

- Potential barrier.
- Depletion layer Breakdown.

c) Explain with circuit diagram the details of drawing the load line & finding the point of operation on the diode characteristics. [8]

Q2) a) A triangular voltage is applied to the biased clipper circuit. Determine the wave shape of the output voltage for the circuit. [3]



b) Differentiate between zener breakdown & avalanche breakdown. [5]

c) Explain how a zener diode maintains constant voltage across the load. [6]

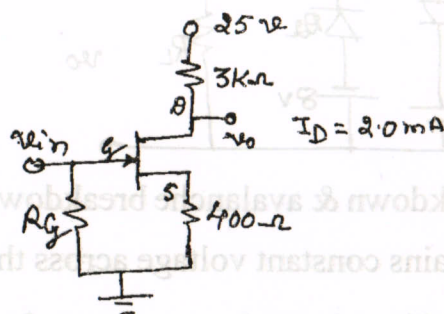
d) Sketch the circuit of a dc restorer. Show input & output waveforms. Briefly explain the operation of the circuit. [6]

MODULE - II

- Q3) a) What are the factor affecting bias variation. [6]
 b) Give reason for wide spread use of CE configuration. [6]
 c) Besides the active region of operation of a transistor, what are the other possible condition of operation of a transistor. Give biasing conditions of each. [8]
- Q4) a) Explain the input and output characteristics of a transistor in CB configuration. [6]
 b) Draw the circuit symbol for an npn transistor & indicate the reference polarities for the voltages & the reference direction for the three current. [6]
 c) Draw the circuits of three transistor amplifier configuration using npn transistor & explain how a voltage amplification is achieved in CE configuration. [8]

MODULE - III

- Q5) a) Determine the value of transconductance of a JFET, when the drain current changes from 1 mA to 1.5 mA with a change in gate voltage from -2.125V to -2V . [2]
 b) Draw the basic construction of an n- channel JFET. [6]
 c) Define JFET parameter & establish relationship between them. [6]
 d) Explain with the help of a diagram the basic CMOS operation. [6]
- Q6) a) Explain the voltage divider biasing arrangement for an n - channel enhancement MOSFET. [6]
 b) For the circuit shown. Determine [6]
 i) V_{DS} and
 ii) V_{GS}



- c) In an N-channel JFET biased by voltage divider method, determine the value of R_S to give operating point $I_D = 4\text{ mA}$ & $V_{DS} = 8\text{ V}$.
 Data provided : $V_{DD} = 25\text{V}$, $R_{G1} = 1.2\text{ M}\Omega$ $R_{G2} = 0.6\text{ M}\Omega$
 JFET parameters : $I_{DSS} = 12\text{mA}$ & $V_p = -4\text{V}$. [8]

MODULE - IV

- Q7)** a) List four application of IR emitter. [2]
 b) Explain the reflective type LCD. [6]
 c) Explain with block diagram feedback concepts. [6]
 d) Describe the OPAMP operation for double ended output with single ended input. [6]
- Q8)** a) Give the manufacturing steps involved in the fabrication of discrete diode. [5]
 b) Explain how internal synchronization is achieved in CRO. [5]
 c) Explain the operation of SCR with a circuit diagram. [5]
 d) Explain the application of photoconductive cell in voltage regulator. [5]



h) Explain the following terms in context with a semiconductor diode.

i) Potential barrier.

ii) Depletion layer. Briefly explain.

Q9) Draw a neat circuit diagram showing the details of drawing the load line, I_{AS} & I_{AV} along the positive operation on the diode characteristics.

Q10) a) A triangular waveform is applied to the biased clipper circuit. Draw the shape of the output voltage for the circuit.



b) Differentiate between zener breakdown & avalanche breakdown.

c) Explain how a zener diode maintains constant voltage across the load.

d) Sketch the circuit of a dc restorer. Show input & output waveforms. Briefly explain the operation of the circuit.