

**F.E. (ETC/ECE) (Semester - II) (RC) (2007 - 2008) Examination,**

**Sept. 2021**

**BASIC ELECTRONICS ENGINEERING**

Duration: 3 Hours

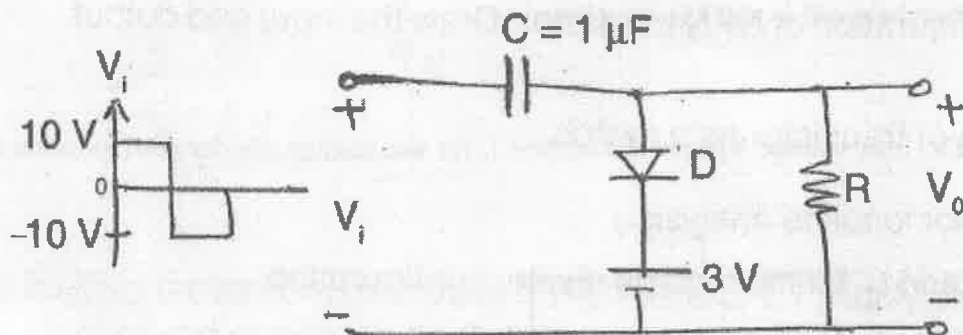
Total Marks: 60

**Instructions:**

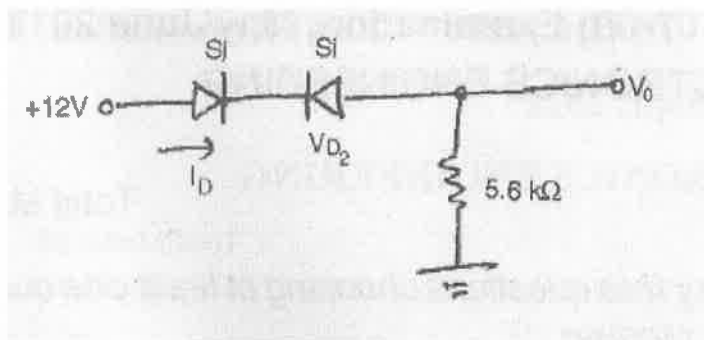
1. Answer any **three** questions, selecting only **one** question from each module
2. Assume suitable data if necessary.
2. Notations have their usual meaning.
3. Figures to the right indicate full marks

**MODULE-I**

1. a) Draw and explain the center tapped full wave rectifier and derive the expression for ratio of rectification [10]
- b) Distinguish between Avalanche and Zener breakdown mechanisms in a semiconductor diode [6]
- c) Determine the output waveform for the following circuit assuming RC constant is very large and diode is ideal [4]



2. a) Why is a filter required in a DC power supply? Draw the circuit of a C- filter and explain the output waveform [5]
- b) Draw and explain the operation of a half wave voltage doubler . [5]
- c) Determine  $I_D$ ,  $V_D$  and  $V_O$  for the following circuit



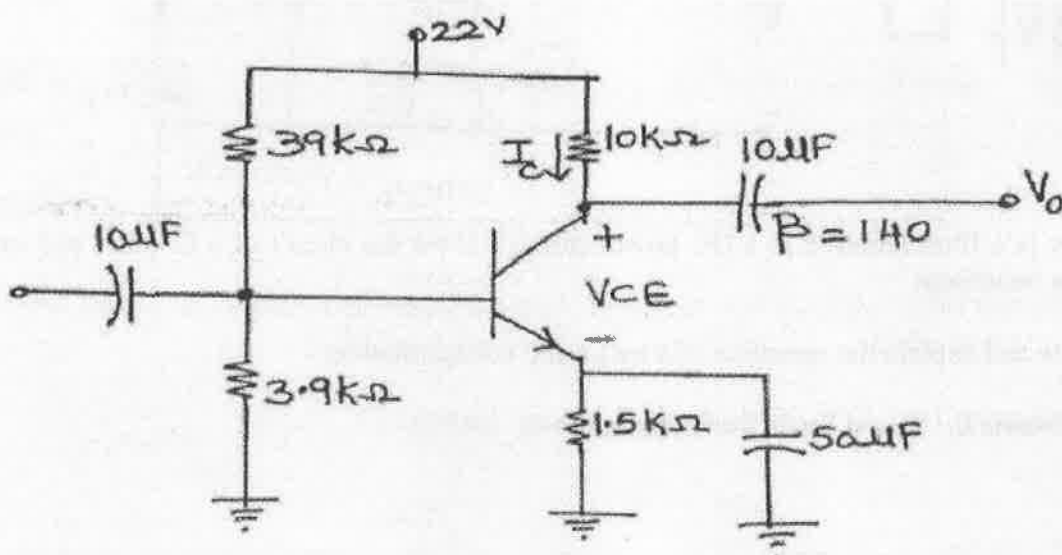
[6]

d) What is an ideal diode? Sketch the characteristics of an ideal diode

[4]

## MODULE-II

3. a) Compare the biasing method of transistor. Which is the best biasing technique. Explain any one biasing technique. [6]
  - b) What do you mean by stabilization of operating point? Explain the reasons why stabilization of Q- point is necessary [6]
  - c) Explain how a transistor can be used as an amplifier . [4]
  - d) Derive the relation between  $I_C$  and  $I_{CEO}$  for a transistor. [4]
4. a) Determine the DC bias voltage  $V_{CE}$  and the current  $I_C$  for the voltage divider configuration of the fig. below [8]



- b) What is thermal runaway? How can it be controlled? [4]
- c) Explain the design and operation of transistor as a switch. [4]
- d) Explain transistor load line analysis. [4]

### MODULE-III

- 5. a) Draw and explain the drain to source characteristics of P-channel JFET. Also explain how the transfer curve is obtained from the output characteristics. [8]
- b) With the help of a neat diagram explain how a Complementary MOSFET can be used as an inverter [6]
- c) Explain the biasing circuit of an enhancement mode MOSFET [6]
- 6. a) Explain the operation of an n-channel depletion type MOSFET. Sketch the device drain characteristics. [8]
- b) With neat circuit diagrams explain the analysis of FET fixed bias circuit and obtain expressions for various voltages [6]
- c) With the help of a neat diagram explain the self- biasing configuration of a JFET. [6]

### MODULE-IV

- 7. a) Explain the grown- junction and diffusion methods to manufacture discrete transistors, with neat diagrams [8]
- b) Explain the op-amp operation in brief with differential input [6]
- c) Explain the concept of feedback and draw the block diagram of basic feedback amplifier. [6]
- 8. a) Explain the operation of SCR [8]
- b) Explain the working of reflective type field- effect LCD with diagram [6]

c) Write short notes on any 2:.

[6]

- i) IR Emitters
  - ii) Solar Cells
  - iii) Thermistor
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