Printed pages: 2 University Roll No. .....

FIRST Mid-Term Examination, 2016-17

B.Tech. I Year, I Semester

ECE 1001: Electronics Engineering

Time: 1 ½ Hrs. **Max Marks: 20**

SECTION-A

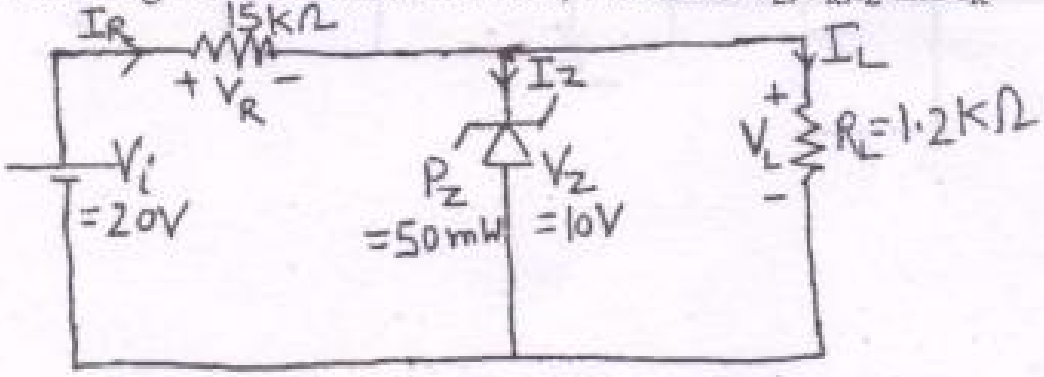
Attempt all Questions. **(1x5=5)**

1. What is forbidden energy gap, E_G?
2. Write the name of two penta-valent impurities.
3. Sketch V-I characteristics of a p-n junction diode.
4. Write the expression for efficiency of half wave rectifier and hence find its maximum efficiency.
5. What is meant by "barrier potential in p-n junction diode?

SECTION –B

Attempt any three questions. **(2x3=6)**

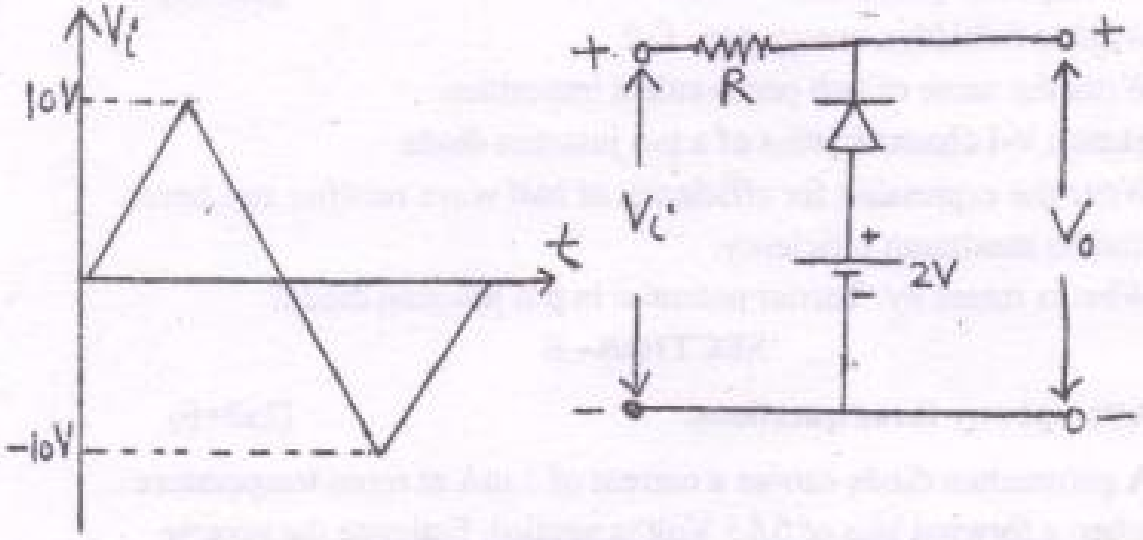
1. A germanium diode carries a current of 1 mA at room temperature when a forward bias of 0.15 Volt is applied. Estimate the reverse saturation current at room temperature?
2. Define dynamic resistance of a p-n junction diode? Write its expression.
3. Differentiate between drift and diffusion currents in semiconductor. Which of these is dominant in a p-n junction diode?
4. For the given Zener diode network, determine V_L, V_R, I_Z and I_R



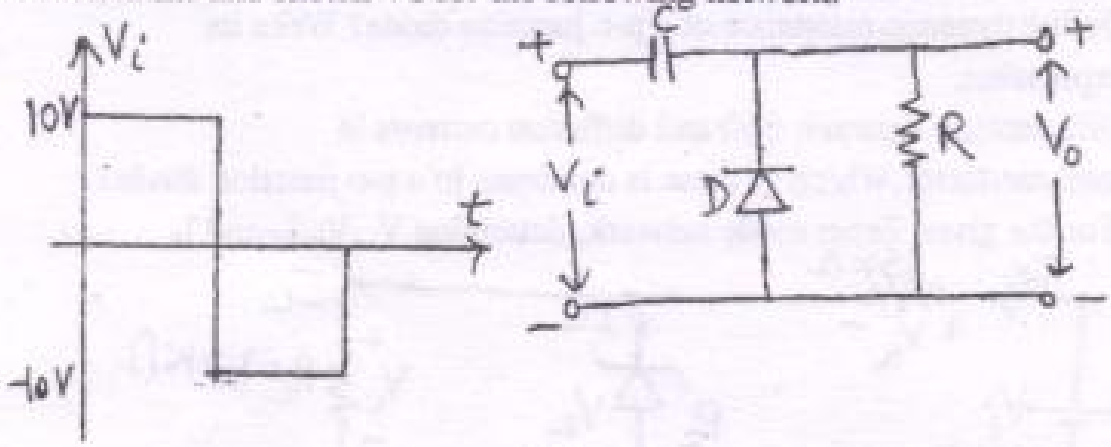
SECTION –C

Attempt any three questions. **(3x3=9)**

1. Explain the transition and diffusion capacitances of a p-n junction diode?
2. Explain the working of a full wave bridge rectifier with neat circuit diagram and find PIV of each diode.
3. Determine and Sketch Vo for the following network.



4. Determine and sketch Vo for the following network.



University Roll No.....

B. Tech. Ist Year, IInd Semester, Ist Term Examination, 2016-17
ECE-1001: Electronics Engineering

Time: 1$\frac{1}{2}$ Hour **Total Marks: 20**

SECTION-A

Attempt ALL Questions. **[5x1 = 5 marks]**

(i) Give the dependency of reverse current (I_o) on temperature.

(ii) What is the significance of ripple factor in rectifiers?

(iii) Find the conductivity of an intrinsic semiconductor if $n_i = 2.5\times10^{16}/m^3$, $\mu_n = 0.13 m^2/V\text{-}S$, $\mu_p = 0.05 m^2/V\text{-}S$.

(iv) Differentiate the ideal and practical Diode.

(v) Draw block diagram of Regulated power supply.

SECTION –B

Attempt any THREE questions. **[3x2 = 6 marks]**

(i) A 230 V, 50 Hz ac voltage is applied to the primary of 5:1 step down transformer used in a bridge rectifier having a load resistance 500 ohm. Assuming the diode to be ideal, determine the following:

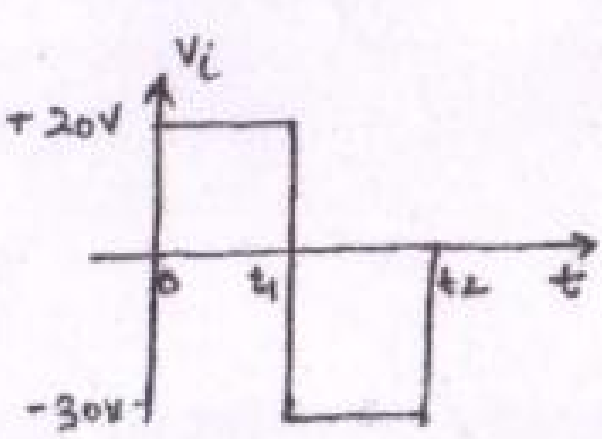
a) Peak Voltage b) dc Voltage delivered to the load

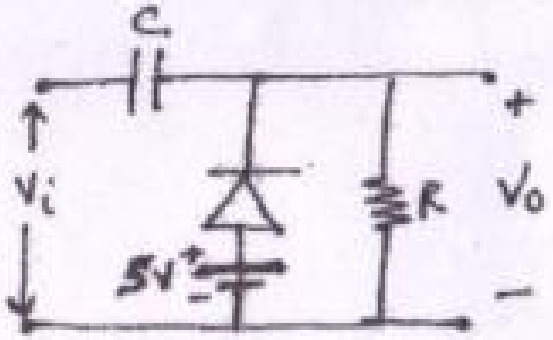
c) PIV of each diode d) dc output voltage.

(ii) Differentiate diffusion and transition capacitance with the help of neat diagrams.

(iii) Explain different breakdown mechanisms in zener diode with neat waveforms and justify why zener breakdown occurs before avalanche breakdown.

(iv) Analyze and sketch the output waveform of the following circuit:





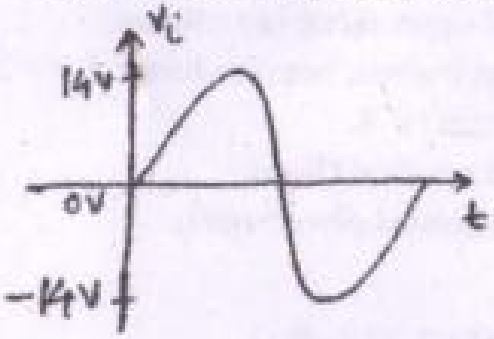
SECTION –C

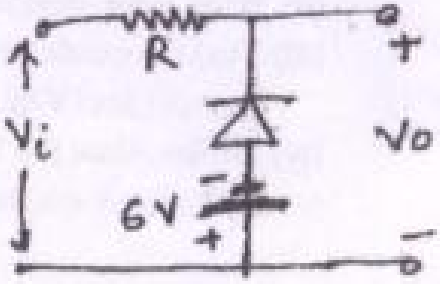
Attempt any THREE questions. **[3 x 3 = 9 marks]**

(i) Justify the V-I characteristics of PN junction diode with proper explanation of forward bias and reverse bias condition.

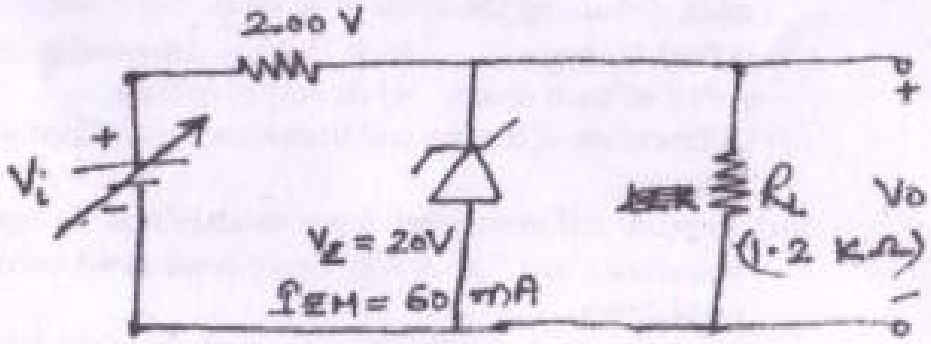
(ii) Assuming an ideal diode sketch the input and output voltage for the half wave rectifier. Also explain its working with neat circuit diagram.

(iii) Analyze and sketch the output waveform of the following circuit:





(iv) Determine the range of V_i for the given circuit that will maintain the zener diode in 'ON' state.



1st Term Examination

Odd-Semester, 2017-18

Program:B.Tech, Branch:All Branches(L to U Section), Year:I

Subject: Electronics Engineering, ECE-1001

Time: 1 Hour Maximum Marks:15

Section A

Note: Attempt all questions. **2X3=6 marks**

1. List the types of resistances present in the diode and derive the formula for dynamic resistance.
2. Differentiate between Zener and Avalanche breakdown. Calculate the reverse saturation current if a diode at room temperature at a forward voltage of 0.4V carries a current of 10mA (Assume ∏=1).
3. Detect the current I and Vo in the circuit shown below.

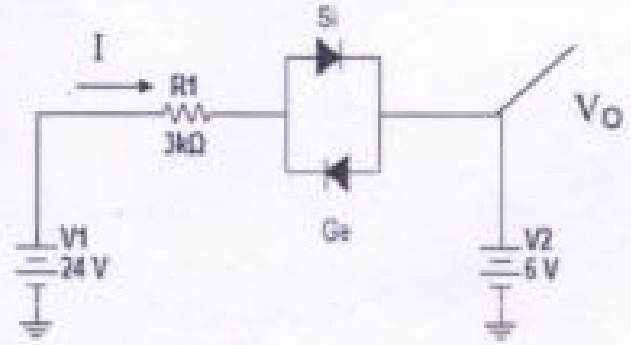


Fig.1

Section B

Note: Attempt all questions. **3X3= 9 marks**

1. Explain the working of Bridge rectifier and drive for dc output voltage and RMS output voltage.
2. Test the circuit shown in Fig.2 for voltage regulation and calculate the value of I_R, I_L, V_L and I_Z

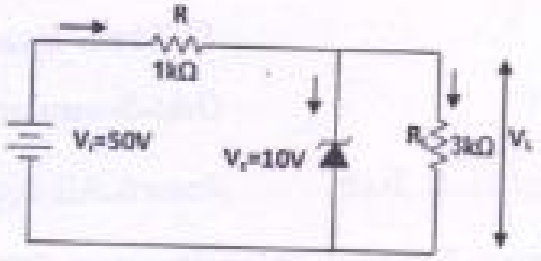


Fig.2

3. Explain and draw the output waveform for the following circuit.

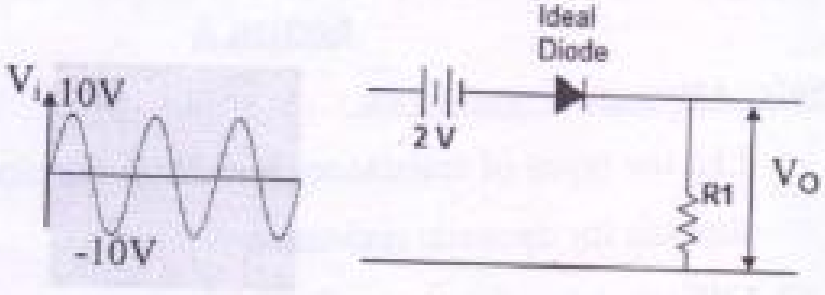


Fig.3

I Term Examination

Odd-Semester, 2018-19

Program:B.Tech Branch:All Branches(Section M to S & U to X)

Subject: Electronics Engineering Code: BECG000I

Time: 1 Hour Year:I Maximum Marks:15

Section A

Note: Attempt All Questions. **2X3=6 marks**

1. List the types of breakdown in diode and their reason of occurrence.
2. Define mass action law. Determine the hole and electron concentration in Si with donor impurity of 1 in 10^8. Given that $n_i=1.5\times10^{10}/cm^3$ & concentration of Si atoms=$5\times10^{22}/cm^3$.
3. Draw the output waveform for the circuit shown in Fig. 1.

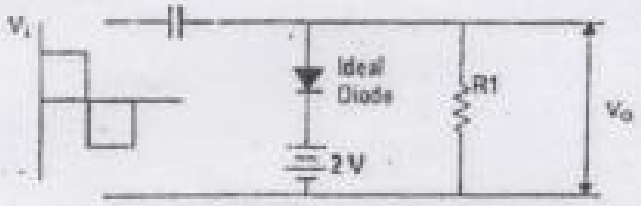


Fig. 1

Section B

Note: Attempt All Questions. **3X3= 9 marks**

1. Explain the working of half wave rectifier showing input and output waveform. Derive the values for V_{rms} and V_{DC} of output waveform.
2. Explain the output waveform for the circuit shown in Fig. 2.

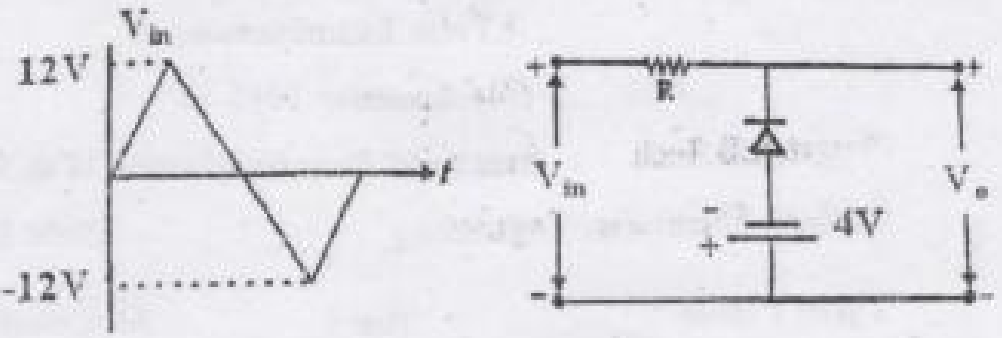


Fig. 2

3. Calculate the values of I_R, I_L, V_L and I_Z for the circuit shown in Fig. 3.

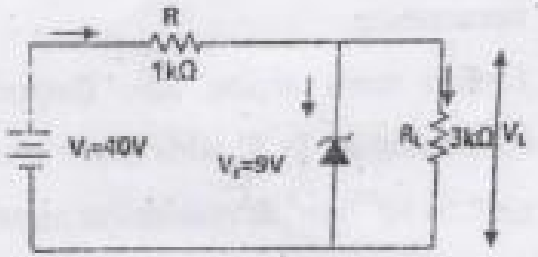


Fig. 3

I Term Examination

Even-Semester, 2018-19

Program:B.Tech Branch:All Branches(Section A to L & T)

Subject: Electronics Engineering Code: BECG0001

Time: 1 Hour Year:1 Maximum Marks:15

Section A

Note: Attempt All Questions. **2X3=6 marks**

1. Define drift and diffusion of charge carriers in semiconductor.
2. Draw the block diagram of regulated power supply and discuss about each block.
3. Draw the output waveform for the circuit shown in Fig. 1.

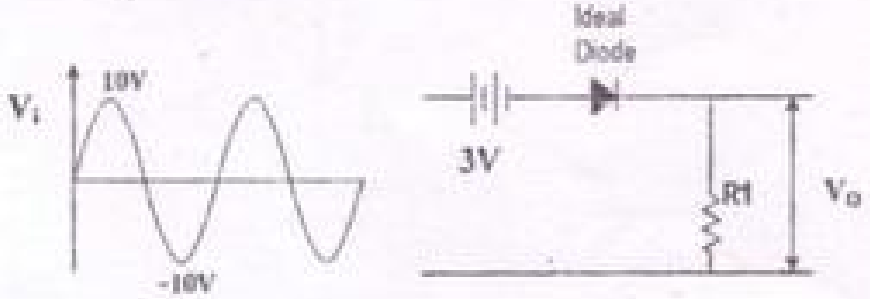


Fig. 1

Section B

Note: Attempt All Questions. **3X3= 9 marks**

1. Determine V_R, V_L and I_Z for the circuit shown in Fig. 2.

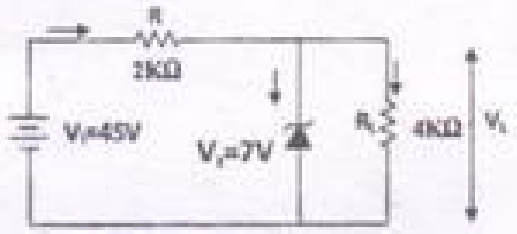


Fig. 2

2. Clarify the concept of capacitance in diode. Derive formula for diode capacitances in forward and reverse bias conditions.
3. Explain the working of centre tap full wave rectifier. Calculate V_{rms} and V_{dc} if the input voltage to full wave rectifier circuit is V_i=100Sin(1000πt).

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I Term Examination, Odd Semester 2019-20

B.Tech (All Branches), I Year, I Semester

Code: BECG0001 **Subject: Electronics Engineering**

Time :2 Hours **Maximum Marks: 30**

Section- A

Note: Attempt All ThreeQuestions. 3 x 2 =06 Marks

1. Define static and dynamic resistance.
2. Calculate the forward bias current of a Si diode when forward bias voltage of 0.4V is applied, the reverse saturation current is 1.17×10^{-9}A and the thermal voltage is 25.2mV.
3. Draw the block diagram of regulated power supply.

Section- B

Note: Attempt All Three Questions. 3 x 3 =09 Marks

1. Draw and explain the output waveform for the circuit shown in Fig. 1.

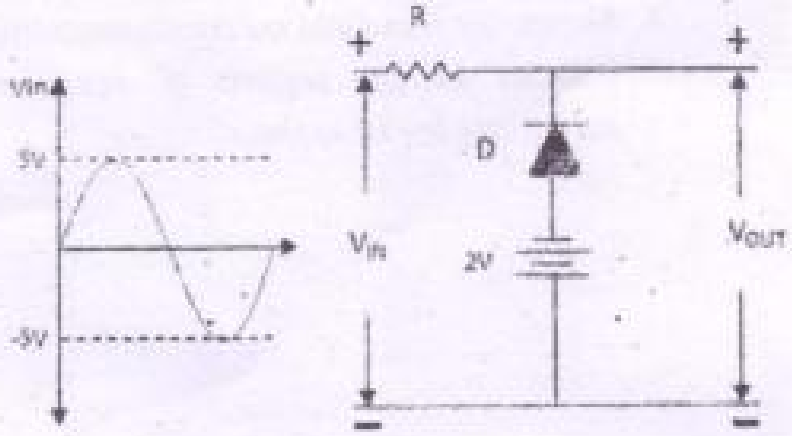

Fig 1

2. What is the need of clamper. Draw the circuit diagram of biased positive claniper and explain its working. .
3. Differentiate between CB, CE and CC Configuration.

Section – C

Note: Attempt Any Three Questions. 3 x 5 = 15 Marks

1. Discuss the working of full wave bridge rectifier. Also derive the value for V_{DC} and V_{rms}.
2. For the circuit shown in Fig. 2, find: (i) the output voltage (ii) the voltage drop across series resistance (iii) the current through zener diode

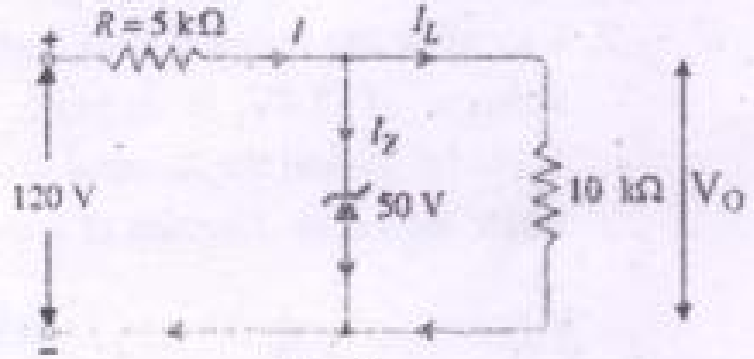

Fig 2

3. Draw the characteristics of p-n junction diode under forward and reverse bias. Also discuss the two types of breakdown.
4. Sketch the input and output characteristics of CE configuration and indicate all the regions of operation. Also give the biasing conditions for all regions.

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Mid-Term Examination, Odd Semester, 2021-22

B.Tech., Year-I, Semester-I

BECG 0001: Electronics Engineering

Time: 2 Hours Maximum Marks: 30

Section- A

3 x 2 = 6 Marks

Note: Attempt All Three Questions.

Q1. Why Silicon is preferred over Germanium? Give any two reasons.

Q2. What is the significance of ripple factor? Calculate ripple factor for a half wave rectifier having maximum input Voltage of 10 V.

Q3. Explain DC and AC diode resistance in brief.

Section- B

3 x 3=9 Marks

Note: Attempt All Three Questions.

Q1. Explain Zener breakdown and Avalanche breakdown.

Q2. Explain operation of Semiconductor diode in brief. Also explain its Current Voltage characteristics.

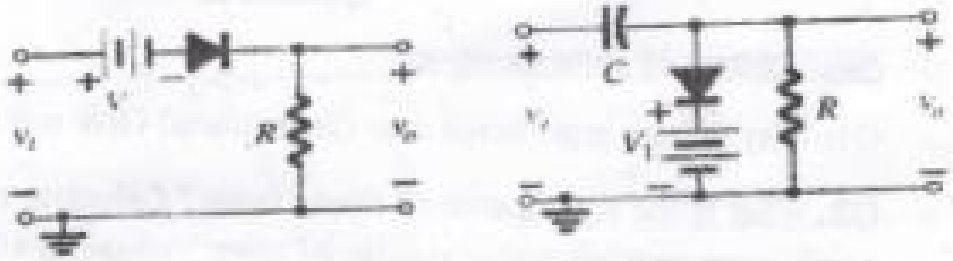
Q3. Find the concentration of holes and electrons in a P-type Germanium at 300K, if the conductivity is 200 $(\Omega\text{-cm})^{-1}$. Also find these values for N-type Silicon, if the conductivity is 0.5 $(\Omega\text{-cm})^{-1}$. Given for Germanium, $n_i=2.5*10^{15}$ /cm^3; $\mu_n=3800$ cm^2/V-Sec; $\mu_p=1800$ cm^2/V-Sec and for Silicon, $n_i=1.5*10^{10}$ /cm^3; $\mu_n=1300$ cm^2/V-Sec; $\mu_p=500$ cm^2/V-Sec.

Section – C

Note: Attempt Any Three Questions. 3 x 5 = 15 Marks

Q1. Draw the circuit of Bridge Rectifier, explain its operation and draw the input-output characteristics. Also derive the expression for RMS value of the output voltage.

Q2. For the circuits shown below, explain the operation and draw the input output characteristics.

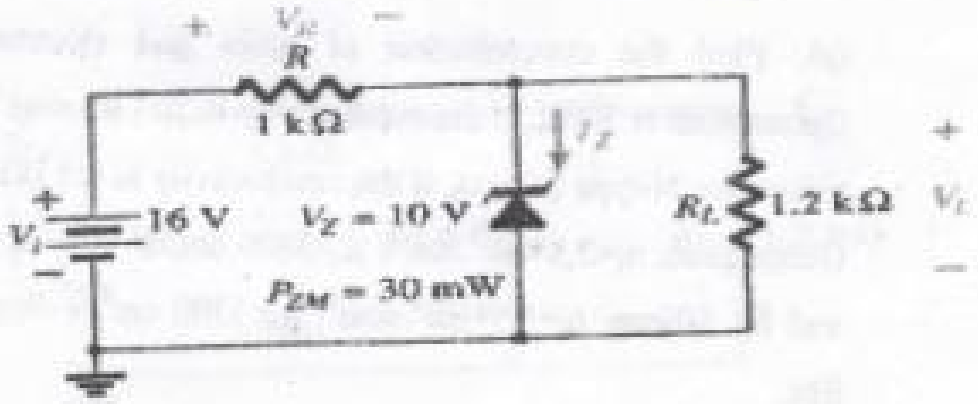


(a) (b)

Q3. In a center tap full wave rectifier, the load resistance is 7500 Ω. Each diode has an ac plate resistance of 50Ω. If the ac voltage applied to each diode has a peak amplitude of 400 V and frequency 50 Hz. Calculate:

(a) I_m, I_{dc}, I_{rms} (b) P_{dc} (c) P_{ac} (d) η (e) ripple factor

Q4. For the Zener diode network shown below, (a) Determine V_L, V_R, I_Z and P_Z. Repeat part (a) with $R_L = 5K\Omega$.



Course Name:

Course Outcome

CO1: Understand semiconductor and transport mechanism of charge carrier in semiconductor material, PN junction diodes with its V-I characteristics.

CO2: Apply the diodes in rectifiers, clippers, clampers and voltage regulator circuits.

CO3: Understand the basic concepts of Bipolar Junction Transistor, Field Effect Transistor and MOSFET's with their characteristics.

CO4: Design DC biasing amplifier circuits using transistors.

CO5: Understand operations amplifier and its applications in the circuits such as adder, subtractor, integrator and differentiator.

CO6: Understand Number systems, theorems and postulates of Boolean algebra, K-Map.

CO7: logic gates, Implementation of logic expression using logic gates, implementation of logic expression using universal gates only.

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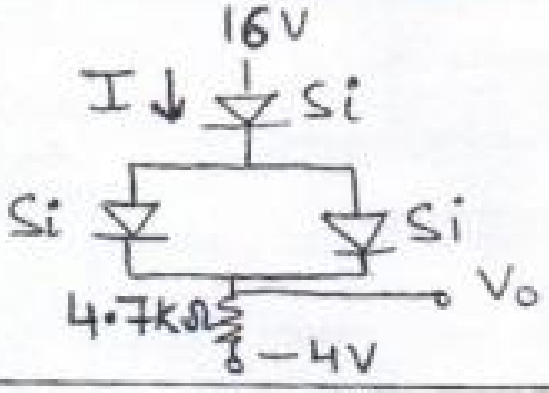
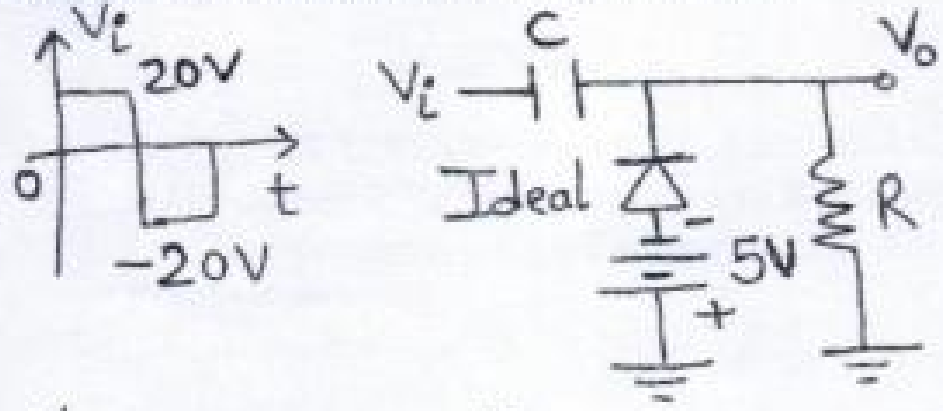
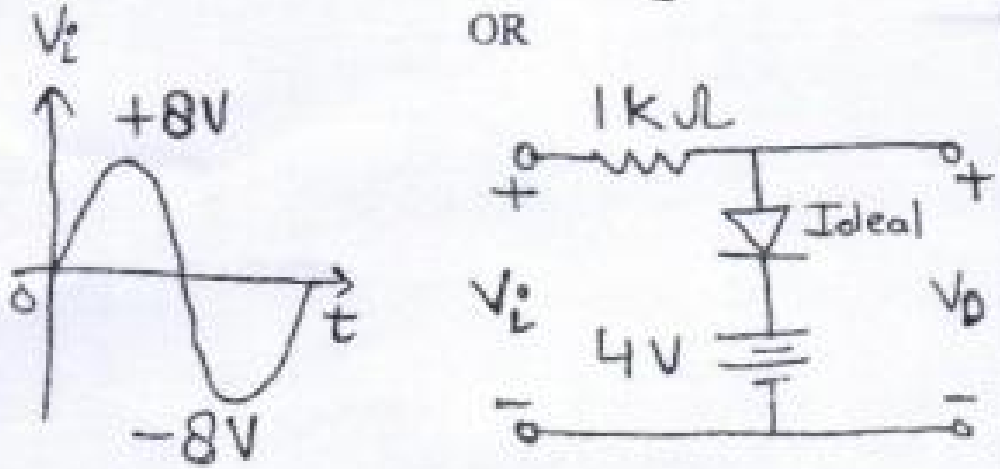
Mid Term Examination, Odd Semester 2022-23
B.Tech (Common to all branch), Ist Year, Ist Semester
BECG 0001: Electronics Engineering

Time: 2 Hours **Maximum Marks: 30**

Section – A

Attempt All Questions 3 X 5 = 15 Marks

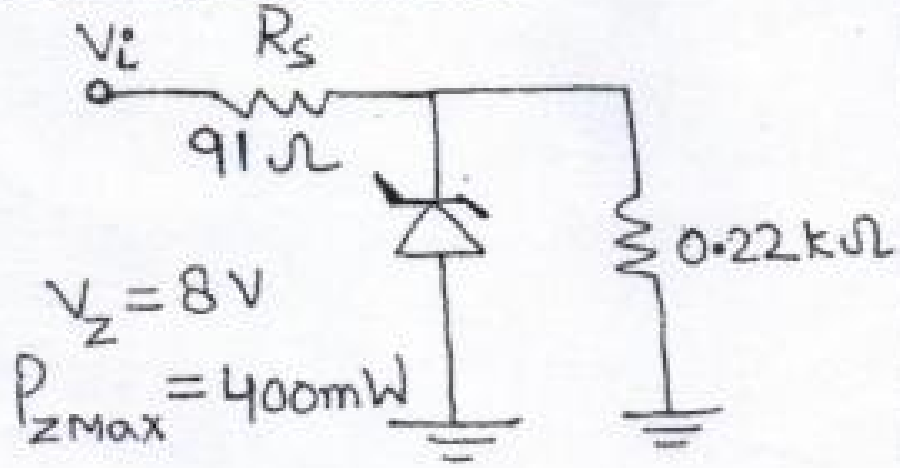
No.	Detail of Question	Marks	CO	BL	KL
1	Explain Diode capacitance.	3	1	U	C
2	Differentiate between Zener and Avalanche breakdown. OR Draw V-I characteristics of p-n diode for 20°C and 100°C.	3	1	U	C
3	a) A germanium diode carries a current of 1mA at room temperature when a forward bias of 0.15V is applied. Calculate reverse current for the same. OR b) For the given circuit determine the value of *I* and *Vo*. 	3	1	A	P

4	a) The mobility's of free electrons and holes in a pure germanium are 0.38 and 0.18 $m^2/V\text{-}s$. Find the value of intrinsic conductivity. Assume $n_i = 2.5 \times 10^{19}/m^3$ at room temperature. b) Find the increase in temperature necessary to increase reverse current by a factor of 100.	3	1	A	P
5	Sketch output waveform for the given circuit  OR  	3	2	A	P

Section – B

Attempt All Questions 5 X 3 = 15 Marks

No.	Detail of Question	Marks	CO	BL	KL
6	Explain the working of n-p-n Bipolar junction transistor. Also give circuit diagram for BJT in common base configuration and common emitter configuration.	5	3	R	F

7	For the given network, determine the range of Vi that will maintain V_L at 8 V and not exceed the maximum power rating of the Zener diode.  	5	2	A	P
8	Explain working of Bridge rectifier and give its input and output waveform. Also derive expression for its Ripple factor.	5	2	U	P

Course Name: **Electronics Engineering**

Course Outcome

CO1: Understand semiconductor and transport mechanism of charge carrier in semiconductor material, PN junction diodes with its V-I characteristics.

CO2: Apply the diodes in rectifiers, clippers, clampers and voltage regulator circuits.

CO3: Understand the basic concepts of Bipolar Junction Transistor, Field Effect Transistor and MOSFET's with their characteristics.

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CO6: Understand Number systems, theorems and postulates of Boolean algebra, K-Map

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Mid Term Examination, Even Semester 2022-23
B.Tech (Common to all branch), Ist Year, Ist Semester
BECG 0001: Electronics Engineering

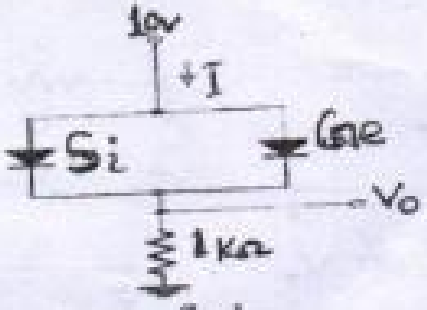
Maximum Marks: 30

Time: 2 Hours

Section – A

3 X 5 = 15 Marks

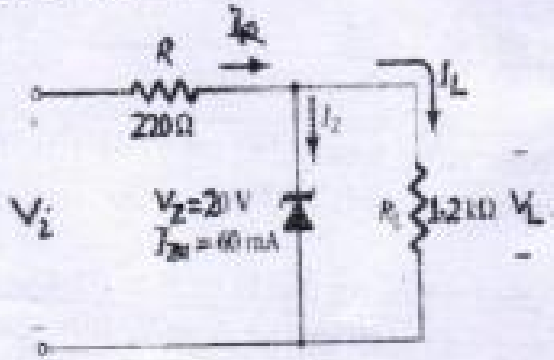
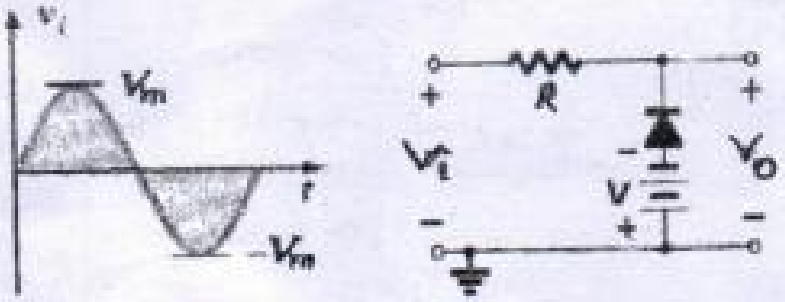
Attempt All Questions

No.	Detail of Question	Marks	CO	BL	KL
1	Define following terms: (a) mobility (b) conductivity of semiconductor and (c) diffusibility. OR Give a brief notes on diode capacitances.	3	1	U	C
2	Given a diode current of 6 mA, junction temperature 27°C, n =1.2, and Is = 1 nA, find the applied voltage V_D. OR Find the static and dynamic resistance of a Ge diode if the temperature is 27°C and reverse saturation current is 1μA for an applied forward bias of 0.2Volt.	3	1	A	P
3	For the given circuit in fig.1, determine the value of *I* and *Vo*.  fig.1	3	1	A	C

4	Briefly explain the each block of a regulated power supply with neat sketch.	3	2	R	F
5	A silicon bar is doped with 18×10^{16} atoms/cm^3 of Boron at room temperature. Mobility of electron and holes are 1300 cm^2/V-s and 500 cm^2/V-s. Calculate the conductivity of the semiconductor. Consider the intrinsic concentration is 1.5×10^{10}.	3	1	A	P

Section – B

Attempt All Questions 5 X 3 = 15 Marks

No	Detail of Question	Marks	CO	BL	KL
6	Consider the circuit given in fig.2, V_i= 30 volts dc. Calculate I_R, I_L, I_Z, V_L and P_Z.  fig.2	5	2	A	C
7	(a) Enlist the advantages and disadvantages of full wave rectifier over half wave rectifier. (b) Consider the circuit given fig.3 where V_m=15 Volts and bias voltage V=5 Volts. Sketch the output waveform.  fig.3	5	2	A	P

8	Explain working of Centre-tap rectifier and give its input and output waveform. Also derive expression for its Ripple factor. OR The input to the bridge rectifier is V_i=200sin(314t) volt and each diode forward resistance is 10Ω. The output is applied to a load of 1.5KΩ. Determine (a) peak value of current through load resistor. (b) output rms value of current and (c) ripple factor.	5	2	U A	P P