Total No. of Printed Pages:04

**F.E. Semester-II (Revised Course 2007-08)**
**EXAMINATION Aug/Sept 2019**
**Basic Electronic Engineering**

**[Duration : Three Hours]**                                        **[Max. Marks : 100]**
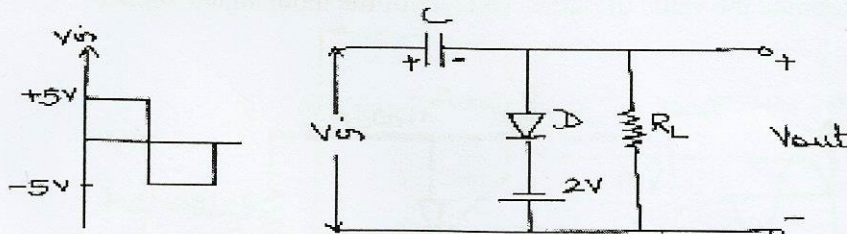
**Instructions:**
        1.  Attempt any five questions choosing at least one question from each module.
        2.  Assume suitable data only if necessary.
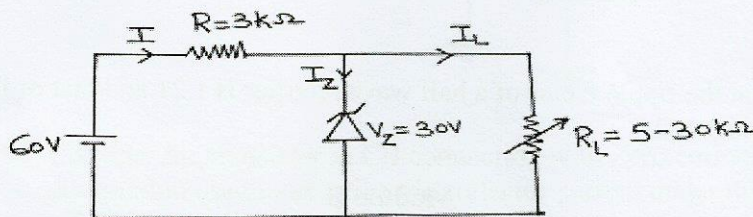
**Module I**

Q.1    a)  Sketch the output waveform of the circuit shown in fig. It is given that the discharging time constant is greater than the time period of input wave.    (5)
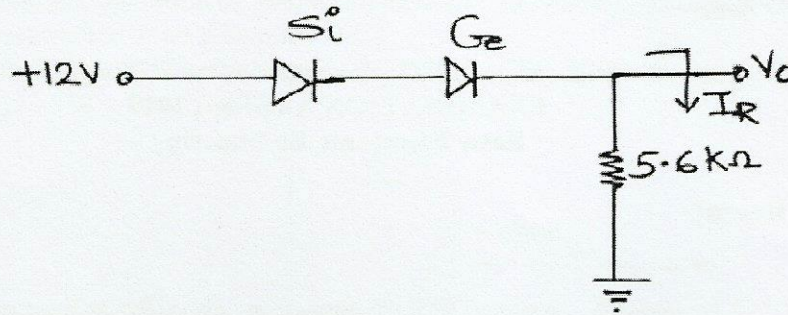


    b)  Using Ideal Zener diode approximations. Find current through the diode of fig when load resistance R is i) 30KΩ  ii) 5 KΩ    (8)



    c)  Explain the effect of temperature on V-I characteristics of diode.    (4)
    d)  Determine $V_O$, ID for the network.    (3)

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Q.2    a)  In a center tapped Full wave rectifier, the rms half secondary voltage is    (5)
           10v. Assuming ideal diodes and load resistance of $R_L = 2K\Omega$. Find the following
           i) Peak current   ii) Dc voltage    iii) Ripple factor
           iv) Efficiency of Rectification
       b)  Determine the value of output voltage for the input signal applied.    (5)
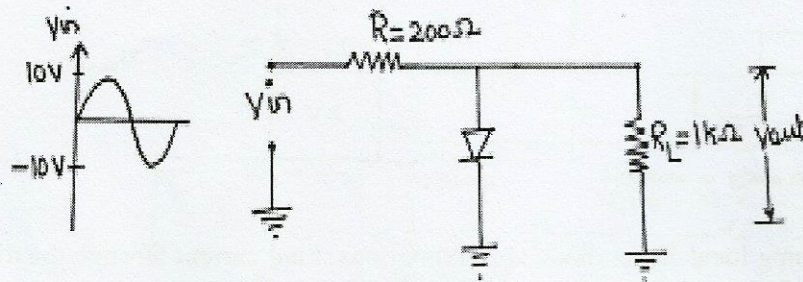


       c)  Prove that the ripple factor of a half wave rectifier is 1.21 and that of full wave    (10)
           rectifier is 0.482.

## Module II

Q.3    a)  Explain how a transistor can be used as an amplifier.    (4)
       b)  Draw and explain the input and output characteristics of common Emitter (CE)    (7)
           Configuration.
       c)  Determine the following for the  fixed bias configuration of the fig given below    (6)
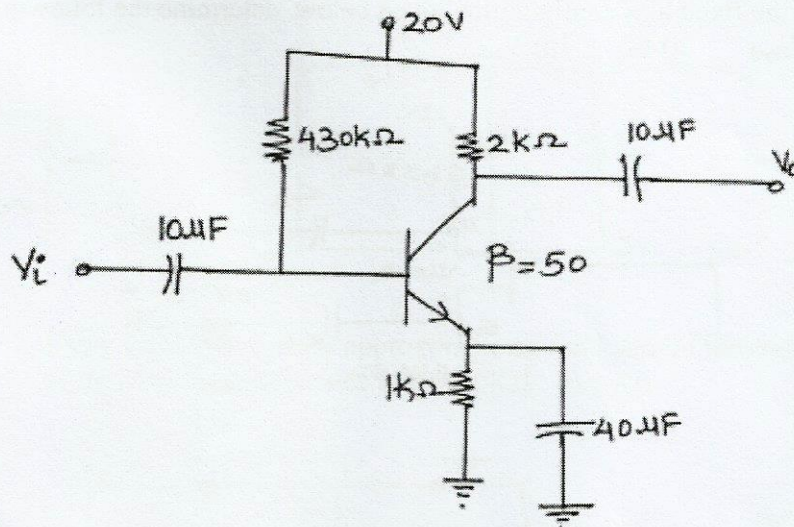           i) $I_{BQ}$ and $I_{CQ}$   ii) $V_{CEQ}$    iii) $V_B$ and VC   iv) $V_{BC}$

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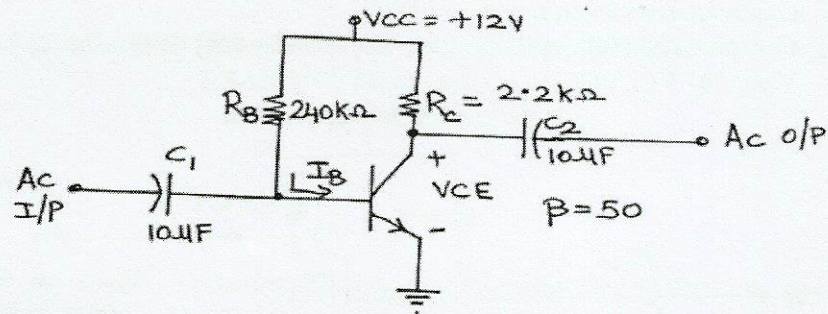
d) What is Thermal Runaway and how it can be controlled. **(3)**

Q.4   a) For the Emitter bias Network Determine $I_B$, $I_C$, $V_{CE}$, $V_C$, $V_E$, $V_B$ and $VBC$.   **(7)**



b) Consider the transistor in CB connection with Zero emitter current. What is the  **(6)**
designation used to describe the collector current under this condition. What
effect would a reduction in temperature have on this current.

c) Distinguish between the emitter, base and collector regions of a transistor.   **(7)**
Derive the relationship between the current gains of CB and CE transistors.
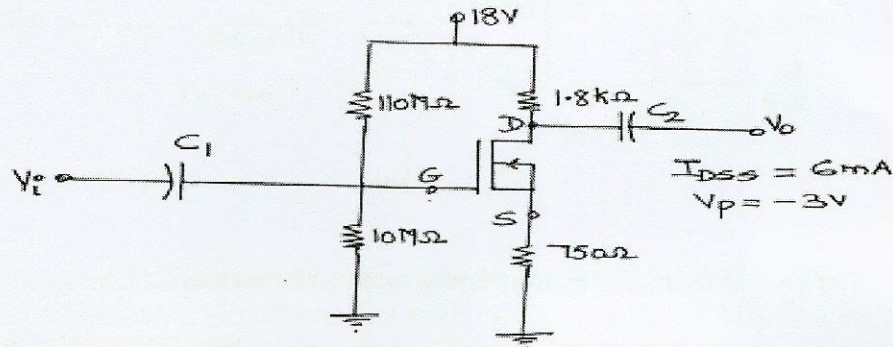
## Module III

Q.5   a) Explain with the help of a constructional diagram the working of a CMOS   **(5)**
Inverter.

b) Explain the working of n channel depletion type MOSFET. Also Draw the   **(10)**
output and transfer characteristics for N channel depletion type MOSFET.

c) Explain why JFET is called a voltage controlled resistor.   **(5)**

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Q.6    a)   Explain the operation of an n channel JFET. Also Draw the output and transfer characteristics of an n channel JFET.    (8)

b)   For the n channel depletion type MOSFET of fig determine a) $I_{DQ}$ and $V_{GSQ}$ b) $V_{DS}$    (6)



c)   For the fixed bias configuration given below, determine the following:    (6)
     i) $V_{GSQ}$     ii) $I_{DQ}$     iii) $V_{DS}$
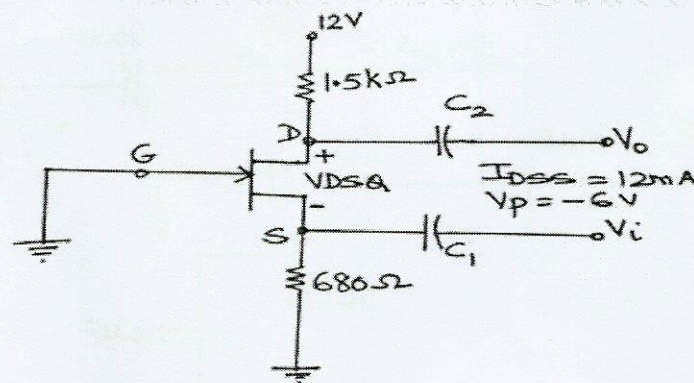


**Module IV**

Q.7    a)   Draw and explain Internal Block diagram of OP-AMP.    (6)
       b)   Explain the working of SCR using two transistor equivalent circuits.    (6)
       c)   Write a note on Photodiode.    (4)
       d)   Explain the manufacturing steps involved in fabrication of discrete diode.    (4)

Q.8    a)   Explain the basic diagram of CRT.    (6)
       b)   Write a note on Thermistor.    (4)
       c)   Draw the block diagram of the feedback circuit used as an oscillator. Explain Barkhausen Criterion for oscillation.    (6)
       d)   Explain the working of Reflective type field effect LCD.    (4)