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ES201

Enrol. No. A7605214079

[ETD]

END SEMESTER EXAMINATION : NOV.-DEC., 2015

**BASIC ELECTRONICS ENGINEERING**

Time : 3 Hrs.

Maximum Marks : 70

**Note:** Attempt questions from all sections as directed.

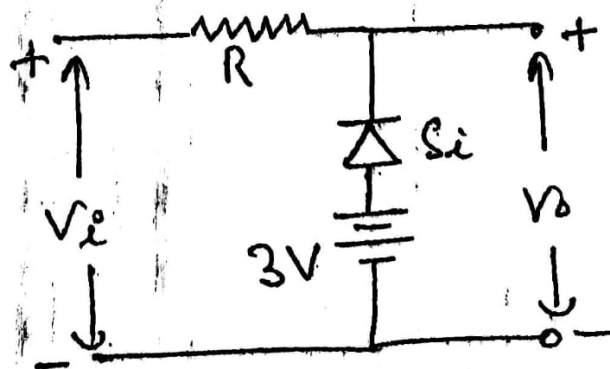
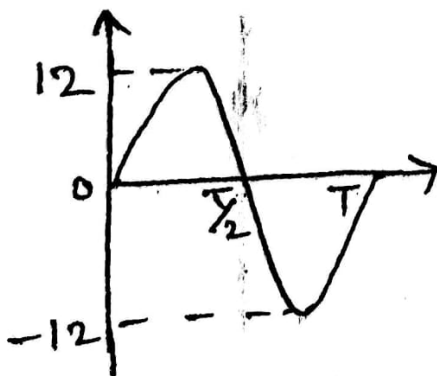
**SECTION - A (30 Marks)**

Attempt any five questions out of six.

Each question carries 06 marks.

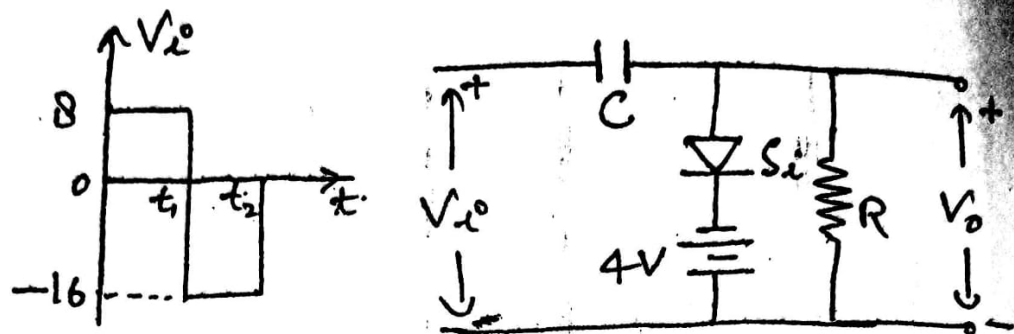
1. Differentiate ideal and practical diode with the help of V-I characteristics. With appropriate circuit diagram explain the DC load line analysis of semiconductor diode.

2. (a) Draw the output of given clipper circuit. (3)



P.T.O.

(b) Draw the output of given clamper circuit.



3. (a) Write the main application of gray and excess-3 codes. Draw truth table and implement full adder using two half adder. (3)
- ✓ (b) An OP-AMP has a slew rate of  $1\text{V}/\mu\text{s}$ . The input signal changes by  $0.5\text{V}$  in  $10\mu\text{s}$ . What can be the closed loop gain of the amplifier? (3)
4. With a neat circuit diagram and waveforms explain the working of full wave bridge rectifier and show that its ripple factor is 0.48.
5. Reduce the following function in SOP form using K-Map.

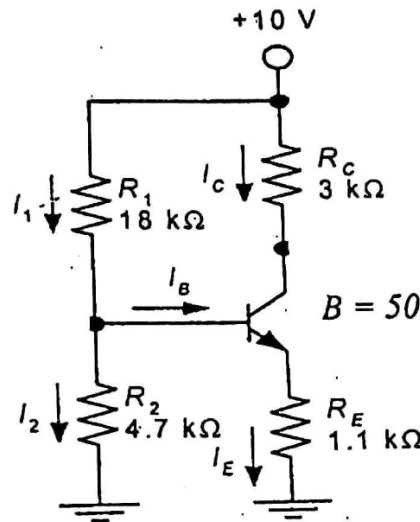
$$F = \Sigma(5,7,8,10,13,15) + \Sigma d(0,1,2,3)$$

Implement the simplified function using only NAND gate. (3+3)

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6. Explain why the operating point is fixed in the center of active region of transistor characteristics in a good voltage amplifier. Determine the values of  $I_{CQ}$  and  $V_{CEQ}$  for the circuit shown in Fig:



**SECTION – B (20 Marks)**

Attempt any two questions out of three.

Each question carries 10 marks.

7. Explain the working of common base configuration of PNP transistor with the help of circuit diagram. Sketch input and output characteristics and indicate active, cut-off and saturation region.
8. (a) What are the advantages of the FET over a conventional BJT? Design and explain the working of enhancement type MOSFET with the help of drain and transfer characteristics. (7)

P.T.O.

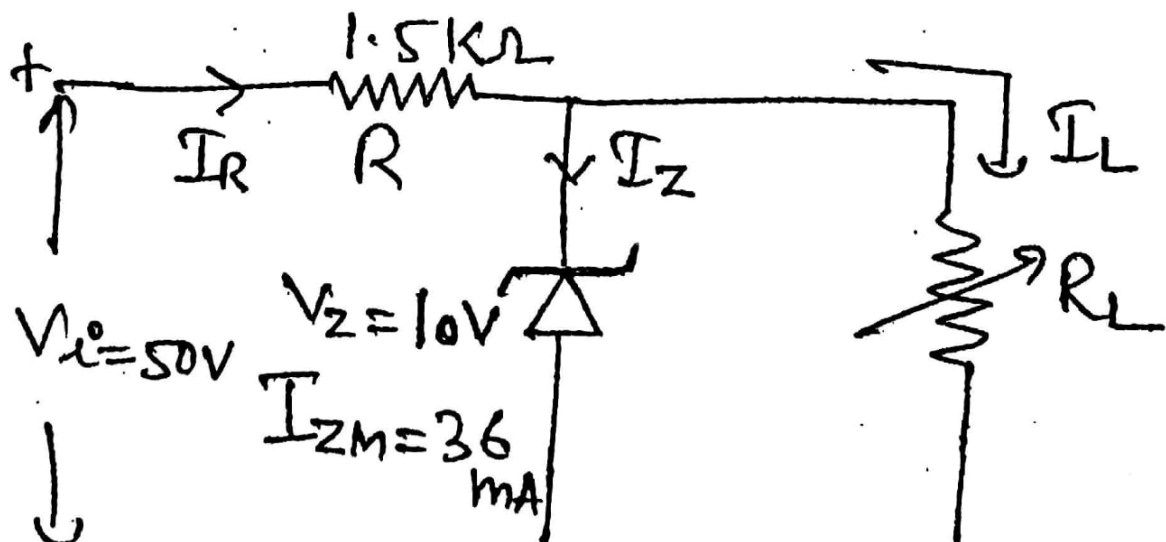


- (b) Given a Q point of  $I_{DQ} = 5\text{mA}$  and  $V_{GS} = -3\text{V}$ .  
Determine  $I_{DSS}$  if  $V_p = -6\text{V}$ . (3)

9. Draw the circuit diagram of non-inverting operational amplifier (OP-AMP) and drive the expression for its closed loop voltage gain. Locate the virtual ground point in the circuit and explain its significance.

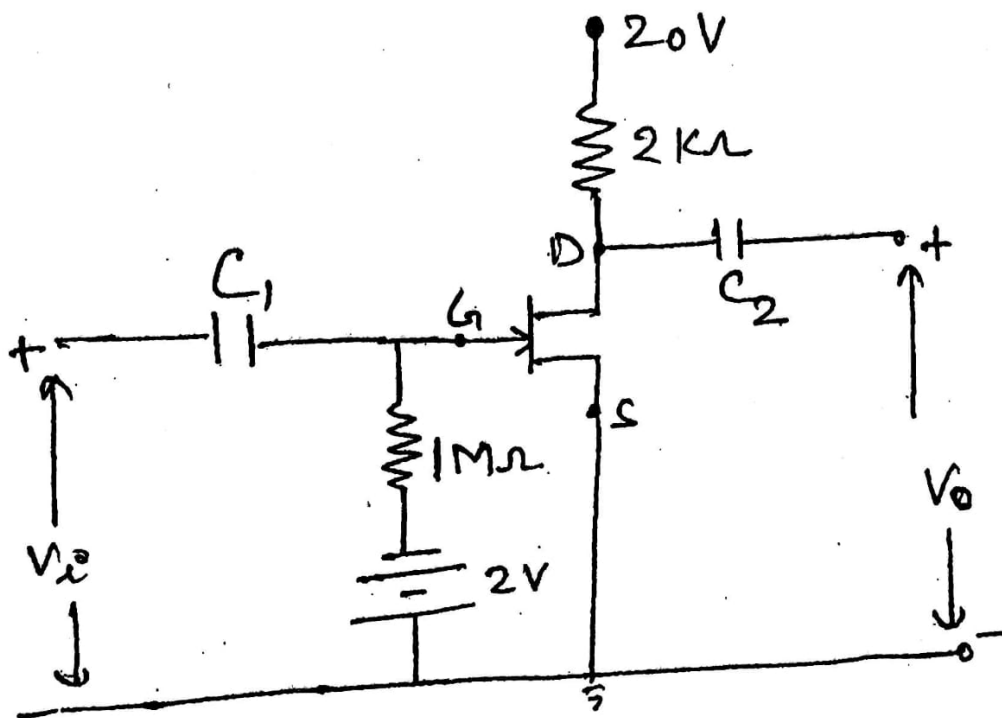
SECTION – C (20 Marks)  
(Compulsory)

10. (a) Show how Zener diode can be used as a voltage regulator. For a given network determine the range of  $R_L$  and  $I_L$  that will result in  $V_{R_L}$  being maintained at 12V. (10)



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- (b) For a JFET fixed bias common source amplifier has an operating point defined by  $V_{GSQ} = -2V$  and  $I_{DQ} = 5.6 \text{ mA}$ , with  $I_{DSS} = 10 \text{ mA}$  and  $V_p = -8V$ . The Value of  $y_{os}$  is provided as  $40\mu S$ . Determine (i)  $g_m$  (ii)  $r_d$  (iii)  $Z_i$  (iv)  $Z_o$  (v)  $A_v$  (6)



- (c) What do you mean by transistor biasing? Discuss with diagrams. (4)