



UF-6247

B. E. - II (Sem. III) (I.T.) Examination

May / June - 2012

Electronics - I

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवही पर अवश्य कभवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. E. - 2 (SEM. 3) (I.T.)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="ELECTRONICS - 1"/>	<input type="text"/>
Subject Code No. : <input type="text" value="6"/> <input type="text" value="2"/> <input type="text" value="4"/> <input type="text" value="7"/> Section No. (1, 2,.....) : <input type="text" value="NIL"/>	<input type="text"/>
	Student's Signature

- (2) Attempt all the questions.
- (3) Figures to the right indicate marks.
- (4) Assume necessary data whenever required.
- (5) Scientific calculators Casio FX 82/83 and equivalent are allowed.

1 (a) Do as directed : 10

- (i) The majority carriers in P-type semiconductors are _____.
- (ii) Free electrons moves in _____ band whereas holes move in _____ band.
- (iii) Define : What is Doping ?
- (iv) Define : Forbidden Energy gap.
- (v) In transistor current conduction is due to _____ charge carrier.
- (vi) In full wave rectifier, if input frequency is 50 Hz, then output frequency is _____.
- (vii) The output resistance of a transistor is much _____ than its input resistance.
(High, Low)
- (viii) Diode has _____ temperature coefficient of resistance.
- (ix) Ripple factor of a full wave rectifier is _____ and of a half wave rectifier is _____.
- (x) When diode is reverse biased, the capacitance is known as _____.

- (b) Explain N-type semiconductor material with diagram. 4
- (c) Explain Transition Capacitance and Storage Capacitance of diode. 6
- 2 (a) Draw and explain full wave rectifier with LC filter with suitable waveforms. Also derive the equation for ripple factor. 8
- (b) (i) For the Zener diode network of fig-1 determine V_L , V_R , I_2 and P_2 . 7
- (ii) Repeat part (i) with $R_L = 3 \text{ k}\Omega$.

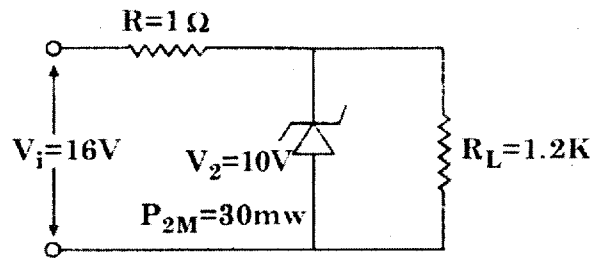


Fig. 1

OR

- 2 (a) Explain concept of dynamic resistance in diode. 7
- (b) Explain effect of infinite coupling capacitor in transistor amplifier. 8
- 3 Write short notes : (any three) 15
- (i) Explain Half wave rectifier.
- (ii) Explain Zener diode
- (iii) Draw and explain Diode AC load line.
- (iv) Establish the following relationship :

(a)
$$\beta = \frac{\alpha}{1 - \alpha}$$

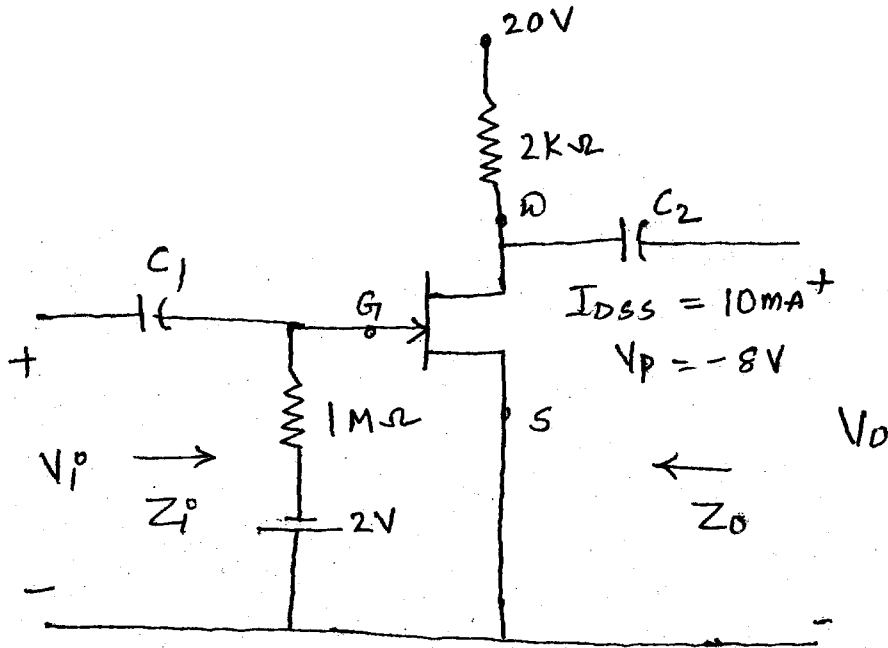
(b)
$$I_c = \frac{\alpha}{1 - \alpha} I_B = \frac{I_{CBO}}{1 - \alpha}$$

- 4 (a) Answer the following : 10
- (i) List the characteristics of FET.
- (ii) Schematic of N-channel MOSFET.
- (iii) Write the Shockley's equation.
- (iv) Sketch the transfer characteristics of N-channel enhancement type MOSFET.
- (v) Relationship between μ and g_m parameter of FET is _____.

- (b) Explain Boost trapping in transistor. 6
 (c) Explain two port network. 4
- 5 (a) Explain advantages and disadvantages of integrated circuits. 7
 (b) Explain the construction and characteristic of JFET. 8

OR

- 5 (a) Explain small signal analysis for CB configuration. 7
 (b) For the given circuit, the operating point is defined by $V_{GSQ} = -2V$ and $I_{DQ} = 5.625 \text{ mA}$ with $I_{DSS} = 10 \text{ mA}$ and $V_p = -8V$. Determine :
 (i) g_m
 (ii) Z_i
 (iii) Z_o
 (iv) Voltage gain A_v
 (v) r_d



- 6 Write short notes : (any three) 15
 (i) Depletion type MOSFET.
 (ii) Emitter follower configuration
 (iii) Impedance reflection
 (iv) Temperature compensation using one diode.