



PAPER ID : 3033

TEC-201

Printed Pages : 3

Paper ID and Roll No. to be filled in your Answer Book

Roll No.

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B. Tech.

(SEM. II) EXAMINATION, 2011

**FUNDAMENTAL OF ELECTRONICS
ENGINEERING**

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all questions.

- 1 Attempt any **four** of the following questions : 4x5=20
- (a) What happens to the conductivity of the semiconductors with the rise in the temperature ? Compare with the conductivity of metals.
 - (b) What is meant by Fermi level in semiconductor ?
 - (c) At room temp. the reverse saturation current is $0.3 \mu A$ when a reverse bias is applied to a Ge diode. Find the value of current following in a diode when 0.15V forward bias is applied.
 - (d) Define conductivity. Derive the expression of conductivity in intrinsic and extrinsic semiconductors.
 - (e) Explain the formation of depletion layer in a p-n junction diode.
 - (f) Explain transition capacitance and diffusion capacitance of a p-n junction diode.
- 2 Attempt any **two** of the following questions : 2x10=20
- (a) Differentiate between clippers and clamper circuits. Discuss biased clippers.
 - (b) With a neat diagram explain the working of C-filter.

(c) Discuss different rectifier circuits. The turns ratio of a transformer used in a half wave rectifier is $n_1:n_2=12:1$. The primary is connected to power mains: 220V, 50Hz. Assuming the diode resistance in forward bias to be zero, calculate the dc voltage across the load. What is the PIV of the diode ?

3 Attempt any **two** of the following questions : $2 \times 10 = 20$

(a) Draw and explain the input and output characteristics of CE configuration of BJT. Indicate all regions of operation.

(b) Define with respect to BJT the following.

I_{CEO} , I_{CBO} , α , β , stability factor.

(c) Derive the hybrid parameter expression of A_I , R_I , A_V , R_O , A_{VS} , A_{IS} , for CE amplifier.

4 Attempt any **two** of the following questions : $2 \times 10 = 20$

(a) Explain the working and characteristics of n channel JFET.

(b) Find the Q point and V_{DS} , for the fixed bias configuration using mathematical and graphical approach.

Given $V_{DD}=15V$, $R_D=2K\Omega$, $R_G=2M\Omega$, $V_{GG}=2V$, $I_{DSS}=10mA$, $V_P=-6V$.

(c) Discuss and draw the drain and transfer characteristics of p channel D-MOSFET.

5 Attempt any **two** of the following questions : $2 \times 10 = 20$

(a) Explain the following :

(i) Demorgan's theorem.

(ii) Universal gates.

(b) Enlist the ideal op-amp characteristics. What is the drawback of open loop configuration. Explain OP-AMP as integrator and differentiator.

(c) (i) Subtract $(11011)_2$ from $(11101)_2$ using 1's compliment method.

(ii) Add $(6E)_{16}$ and $(34)_{16}$

(iii) Minimize using K-map

$$Y = \sum m(1,3,7,11,15) + d(0,2,5)$$