B.Tech
(SEM I) ODD SEMESTER THEORY EXAMINATION 2009-10
ELECTRONICS ENGINEERING

Time: 3 Hours
[Total Marks: 100

Note: Attempt all the questions.

1. Attempt any two parts of the following: 10x2 = 20

(a) With a neat energy band diagram, explain the working of a p-n junction diode in reverse bias.

(b) Draw the forward characteristics of a p-n junction diode and explain its:

(i) static resistance
(ii) dynamic resistance and
(iii) average a.c. resistance.

(c) Name the capacitances associated with a p-n junction diode and explain the causes and dependence of these capacitances.
2 Attempt any two parts of the following: 10×2=20
(a) Explain the working of following circuit:

(b) Draw the circuit of a full wave rectifier. Derive the expression for its ripple factor.

(c) Draw the output waveform of a full wave rectifier and compare its performance with
   (i) C filter (ii) LC filter.

3 Attempt any two parts of the following: 10×2=20
(a) Draw the BJT circuits for CB, CC and CE configurations. Compare $Z_i$, $Z_o$, $A_V$ and $A_I$ for the above configurations.

(b) Draw the circuit of a BJT in CE configuration employing voltage divider biasing. Calculate its stability against $I_{CO}$.

(c) Using a low frequency hybrid model, calculate $A_V$ and $A_I$ of a 2 stage RC coupled BJT amplifier.

JJ-3033] 2 [Contd...
Attempt any **two** parts of the following: \(10 \times 2 = 20\)

(a) With a neat sketch, explain the working of an n-channel JFET.

(b) With a neat sketch, explain the working of a p-channel depletion mode MOSFET.

(c) Draw the circuit of a JFET amplifier in all the three configurations. Compare \(A_V\), \(A_I\), \(Z_i\), \(Z_o\) for all of them.

Attempt any **two** parts of the following: \(10 \times 2 = 20\)

(a) (i) Convert \(\text{FE}_4 \times \text{A}_{\text{hex}}\) into Decimal 7650 octal into hex 11010110 binary into octal.

(ii) Draw the circuit of a 2 input EX-OR gate using four 2 input NAND gates.

(b) Minimise the following K-Map:

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<th>01</th>
<th>11</th>
<th>10</th>
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<tbody>
<tr>
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(c) Draw an op-amp based circuit to give \(V_0 = V_1 + V_2 + V_3\).