Code.No: R07A1EC06 | R07 | SET-1

I B.TECH – EXAMINATIONS, DECEMBER - 2010
ELECTRONIC DEVICES AND CIRCUITS
(COMMON TO ECE, CSE, EIE, BME, IT, E.CON.E, CSS, ETM, ECC & ICE)
Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1. Compare the motion and trajectories of electron when placed:
   i) Only in electric field
   ii) Only in Magnetic field
   iii) Combined electric and magnetic fields. [16]

2.a) Compare the characteristics of a p-n Junction diode, zener diode and tunnel diode.
   b) What is Fermi-level? Prove that the Fermi level in an 'n'-type material is much closed to conduction band. [8+8]

3.a) Derive the expression for ripple factor, regulation and rectification efficiency of a half wave rectifier.
   b) Compare Full wave and Bridge rectifiers from the view point of ripple factor, regulation, rectification efficiency and PIV ratings of diodes. [8+8]

4.a) Explain how transistor acts as an amplifier.
   b) What is pinch-off voltage? Sketch the region in a bar of FET channel and explain. From the transfer characteristic relation using $g_m = \frac{\partial i_D}{\partial V_{GS}} \Big/ V_{DS}$, show that $g_m = g_{mo}\left[1 - \frac{v_{GS}}{v_p}\right]$ Where $g_{mo} = \frac{-2\,I_{DSS}}{v_p}$. [8+8]

5.a) Draw the circuit diagram of a fixed bias and self bias circuits and derive the expressions for the stability factors.
   b) Explain the term "Thermal Runaway". [8+8]

6. With the help of approximate hybrid model. Derive the expressions for current gain, input impedance, output impedance and voltage gain of a CC amplifier. [16]

7.a) Draw the block diagram of a feed back amplifier and derive the closed loop transfer function.
   b) Derive the expressions for A_v, Z_i, Z_0 and A_i of a voltage shunt feedback amplifier. [8+8]

8.a) Give the circuit diagram of a colpitts oscillator and explain its working.
   b) What is the importance of crystal oscillator? Give the equivalent circuit of a quartz crystal. [8+8]

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Code.No: R07A1EC06 | R07 | SET-2

I B.TECH – EXAMINATIONS, DECEMBER - 2010
ELECTRONIC DEVICES AND CIRCUITS
(COMMON TO ECE, CSE, EIE, BME, IT, E.CON.E, CSS, ETM, ECC & ICE)
Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Derive the expression for ripple factor, regulation and rectification efficiency of a half wave rectifier.
b) Compare Full wave and Bridge rectifiers from the view point of ripple factor, regulation, rectification efficiency and PIV ratings of diodes. [8+8]

2.a) Explain how transistor acts as an amplifier.
b) What is pinch-off voltage? Sketch the region in a bar of FET channel and explain. From the transfer characteristic relation using $g_m = \frac{\partial i_D}{\partial V_{GS}} / V_{DS}$, show that $g_m = g_{mo}\left[1-\frac{v_{GS}}{v_p}\right]$ Where $g_{mo} = \frac{-2I_{DSS}}{v_p}$. [8+8]

3.a) Draw the circuit diagram of a fixed bias and self bias circuits and derive the expressions for the stability factors.
b) Explain the term "Thermal Runaway". [8+8]

4. With the help of approximate hybrid model. Derive the expressions for current gain, input impedance, output impedance and voltage gain of a CC amplifier. [16]

5.a) Draw the block diagram of a feed back amplifier and derive the closed loop transfer function.
b) Derive the expressions for A_v, Z_i, Z_0 and A_i of a voltage shunt feedback amplifier. [8+8]

6.a) Give the circuit diagram of a colpitts oscillator and explain its working.
b) What is the importance of crystal oscillator? Give the equivalent circuit of a quartz crystal. [8+8]

7. Compare the motion and trajectories of electron when placed:
i) Only in electric field
ii) Only in Magnetic field
iii) Combined electric and magnetic fields. [16]

8.a) Compare the characteristics of a p-n Junction diode, zener diode and tunnel diode.
b) What is Fermi-level? Prove that the Fermi level in an 'n'-type material is much closed to conduction band. [8+8]

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Code.No: R07A1EC06 | R07 | SET-3

I B.TECH – EXAMINATIONS, DECEMBER - 2010
ELECTRONIC DEVICES AND CIRCUITS
(COMMON TO ECE, CSE, EIE, BME, IT, E.CON.E, CSS, ETM, ECC & ICE)
Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Draw the circuit diagram of a fixed bias and self bias circuits and derive the expressions for the stability factors.
b) Explain the term "Thermal Runaway". [8+8]

2. With the help of approximate hybrid model. Derive the expressions for current gain, input impedance, output impedance and voltage gain of a CC amplifier. [16]

3.a) Draw the block diagram of a feed back amplifier and derive the closed loop transfer function.
b) Derive the expressions for A_v, Z_i, Z_0 and A_i of a voltage shunt feedback amplifier. [8+8]

4.a) Give the circuit diagram of a colpitts oscillator and explain its working.
b) What is the importance of crystal oscillator? Give the equivalent circuit of a quartz crystal. [8+8]

5. Compare the motion and trajectories of electron when placed:
i) Only in electric field
ii) Only in Magnetic field
iii) Combined electric and magnetic fields. [16]

6.a) Compare the characteristics of a p-n Junction diode, zener diode and tunnel diode.
b) What is Fermi-level? Prove that the Fermi level in an 'n'-type material is much closed to conduction band. [8+8]

7.a) Derive the expression for ripple factor, regulation and rectification efficiency of a half wave rectifier.
b) Compare Full wave and Bridge rectifiers from the view point of ripple factor, regulation, rectification efficiency and PIV ratings of diodes. [8+8]

8.a) Explain how transistor acts as an amplifier.
b) What is pinch-off voltage? Sketch the region in a bar of FET channel and explain.
From the transfer characteristic relation using $g_m = \frac{\partial i_D}{\partial V_{GS}} \Big/ V_{DS}$, show that $g_m = g_{mo}\left[1 - \frac{v_{GS}}{v_p}\right]$ Where $g_{mo} = \frac{-2 I_{DSS}}{v_p}$. [8+8]

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Code.No: R07A1EC06 | R07 | SET-4

I B.TECH – EXAMINATIONS, DECEMBER - 2010
ELECTRONIC DEVICES AND CIRCUITS
(COMMON TO ECE, CSE, EIE, BME, IT, E.CON.E, CSS, ETM, ECC & ICE)
Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Draw the block diagram of a feed back amplifier and derive the closed loop transfer function.
b) Derive the expressions for A_v, Z_i, Z_0 and A_i of a voltage shunt feedback amplifier. [8+8]

2.a) Give the circuit diagram of a colpitts oscillator and explain its working.
b) What is the importance of crystal oscillator? Give the equivalent circuit of a quartz crystal. [8+8]

3. Compare the motion and trajectories of electron when placed:
i) Only in electric field
ii) Only in Magnetic field
iii) Combined electric and magnetic fields. [16]

4.a) Compare the characteristics of a p-n Junction diode, zener diode and tunnel diode.
b) What is Fermi-level? Prove that the Fermi level in an 'n'-type material is much closed to conduction band. [8+8]

5.a) Derive the expression for ripple factor, regulation and rectification efficiency of a half wave rectifier.
b) Compare Full wave and Bridge rectifiers from the view point of ripple factor, regulation, rectification efficiency and PIV ratings of diodes. [8+8]

6.a) Explain how transistor acts as an amplifier.
b) What is pinch-off voltage? Sketch the region in a bar of FET channel and explain.
From the transfer characteristic relation using $g_m = \frac{\partial i_D}{\partial V_{GS}} / V_{DS}$, show that
$g_m = g_{mo}\left[1 - \frac{v_{GS}}{v_p}\right]$ Where $g_{mo} = \frac{-2 I_{DSS}}{v_p}$. [8+8]

7.a) Draw the circuit diagram of a fixed bias and self bias circuits and derive the expressions for the stability factors.
b) Explain the term "Thermal Runaway". [8+8]

8. With the help of approximate hybrid model. Derive the expressions for current gain, input impedance, output impedance and voltage gain of a CC amplifier. [16]

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