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B.E / B.Tech Degree Examination,, May 2012
III Semester Electrical and Electronics Engineering R-2008
EC9215 ELECTRONIC DEVICES AND CIRCUITS

Time : 3 hours

Answer all Questions

Max.marks: 100

PART-A

(2x10=20marks)

1. How does a Zener diode act as a voltage regulator?
2. Specify the need for biasing of Bipolar Junction Transistors?
3. Give the classification of MOSFET.
4. Compare the function of LED and PN junction diode..
5. Bring-out the advantages of BiCMOS Cascode Amplifier,
6. Mention any two applications of an Emitter follower.
7. Define CMRR.
8. What are the advantages of Negative feedback amplifiers?
9. State Barkhausen criterion.
10. List the applications of Laser diodes.

PART-B

(5x16=80marks)

11. (i) Draw and explain the V-I characteristics of a PN Junction diode in
(a) forward bias and (b) reverse bias conditions (6)
(ii) What is drift and diffusion capacitance in PN junction diode. (4)
(iii) Derive the diode current equation and explain the effect of temperature on
the Volt-Amp characteristics of a diode. (6)
 12. (a) (i) Describe the structure and working of a BJT with neat diagrams. (10)
(ii) Derive the current-voltage relationship of NPN transistor in active
mode of operation. (6)
- (OR)**
12. (b) (i) Explain the operation of JFET with neat diagrams. (10)
(ii) The data sheet of a JFET indicates that $I_{DSS} = 15\text{mA}$ and $V_{GS(off)} = -5\text{V}$
Determine the drain current for $V_{GS} = 0\text{V}$ and -1V . (6)
13. (a) Draw the circuit of a Common Emitter amplifier with emitter and voltage divider
biasing circuits. Derive the expression for the voltage gain and draw the frequency
response characteristics of the above amplifier.

(OR)

13. (b) Draw the circuit diagram of a Common base amplifier and derive the expression for the current gain and voltage gain.

14. (a) (i) Explain with diagrams the operation of a BJT in differential mode configuration (12)

(ii) Draw the transfer characteristics of a BJT differential pair. (4)

(OR)

14. (b) Explain the basic working principle of a tuned amplifier. With neat diagrams explain the operation of a single tuned amplifier with the frequency response characteristics.

15. (a) (i) Draw and explain with Block diagram the Voltage series feedback amplifier. (10)

(ii) Discuss the effect of feedback on the input resistance and output resistance for the Current series and Current Shunt feedback connections. (6)

(OR)

15.b) (i) What are the classifications of Oscillators. and explain the Basic working principle of RC Oscillators. (8)

(iii) Explain the operation of Wein Bridge Oscillator and derive the expression for its frequency of oscillation. (8)
