

Reg. No. :

--	--	--	--	--	--	--	--	--	--

**Question Paper Code: 31335**

B.E. / B.Tech. DEGREE EXAMINATION, NOVEMBER 2015

Third Semester

Electrical and Electronics Engineering

01UEE305 - SEMICONDUCTOR DEVICES AND CIRCUITS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Compare the reverse characteristics of a PN diode with a Zener diode.
2. Define load regulation and line regulation.
3. When does a transistor act as a switch?
4. Write down the applications of Opto couplers.
5. Derive the relation between  $\alpha$  and  $\beta$ .
6. What is the advantage of using Darlington connection?
7. Differentiate the various classes of power amplifier.
8. Discuss any two merits of negative feedback.
9. Give some input and output examples for an integrator circuit.
10. Draw a positive clamper circuit with output waveform.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Write notes on drift and diffusion currents in a diode. (8)  
(ii) Discuss the V-I characteristics of Zener diode under different temperatures. (8)

Or

- (b) (i) Discuss the necessity of filter and explain the filtering concept using passive filters. (10)
- (ii) Discuss the characteristics of Liquid Crystal Display (LCD). (6)
12. (a) (i) Discuss the circuit operation and V-I characteristics of a transistor under CE mode. (10)
- (ii) What is thermal runaway? How this problem is rectified? (6)

Or

- (b) (i) Differentiate power transistor from basic transistor. (6)
- (ii) Discuss the switching characteristics of Bipolar Junction Transistor. (10)
13. (a) Explain the structure, working and V-I characteristics of N channel depletion type MOSFET. (16)

Or

- (b) (i) Develop the small signal model for a Junction Field Effect Transistor. (6)
- (ii) Derive the parameters of Junction Field Effect Transistor under common source configuration. (10)
14. (a) (i) Explain the working of single tuned voltage amplifier. (8)
- (ii) Discuss the merits of transformer coupling over tank circuit. (8)

Or

- (b) (i) Derive the expression for gain for a negative feedback amplifier. (8)
- (ii) Explain the working of Hartley oscillator with resonant frequency. (8)
15. (a) (i) Discuss the working of saw tooth oscillator circuit using Uni-Junction transistor. (8)
- (ii) Write notes on differentiator circuits. (8)

Or

- (b) (i) Classify the diode clipper circuits. (4)
- (ii) Explain any three clipper circuits with output waveforms. (12)