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Question Paper Code: 51335

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Electrical and Electronics Engineering

15UEE305 - SEMICONDUCTOR DEVICES AND CIRCUITS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- The breakdown mechanism in a lightly doped P-N junction under reverse biased condition is called
 - Avalanche breakdown
 - Zener breakdown
 - Breakdown by tunneling
 - High voltage breakdown
- In a full-wave rectifier without filter, the ripple factor is
 - 0.482
 - 1.21
 - 1.79
 - 2.05
- A transistor is a
 - Current controlled current device
 - Current controlled voltage device
 - Voltage controlled current device
 - Voltage controlled voltage device
- Which of the BJT configuration is suitable for impedance matching
 - Common Base Configuration
 - Common Emitter Configuration
 - Common Collector Configuration
 - None of these
- A JFET is also called _____ transistor.
 - Bipolar
 - Unijunction
 - Uni polar
 - None of these

6. A MOSFET operates in _____ mode.
- (a) Depletion (b) Enhancement
(c) Both (a) and (b) (d) None of these
7. A negative feedback is employed in
- (a) Oscillator (b) Amplifiers (c) Rectifiers (d) None of these
8. The main advantage of a crystal oscillator is that its output is
- (a) 50Hz to 60Hz (b) Variable frequency
(c) Constant frequency (d) DC
9. An Astable multivibrator has
- (a) No Stable State (b) One Stable State
(c) Two Stable States (d) None of these
10. The negative clipper is that which removes the _____ half cycle of the input voltage.
- (a) Positive (b) Negative (c) Both (a) and (b) (d) None of these

PART - B (5 x 2 = 10 Marks)

11. What is diffusion current?
12. State the relation between ' α ' and ' β ' of a transistor.
13. What is Darlington pair?
14. Define CMRR of differential amplifier.
15. What is meant by hysteresis in Schmitt trigger?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the working of a PN Junction diode and Zener diode and explain the V-I characteristics. (16)

Or

- (b) (i) Write a note on light emitting diode with net sketches and give its applications. (8)
- (ii) Explain the temperature effects on PN junction diodes. (8)

17. (a) Explain the input and output characteristics of BJT in CE configuration and derive the hybrid parameters. (16)

Or

- (b) (i) Explain the important characteristics of Opto coupler in electronic isolator circuits. (8)
(ii) Compare CE, CB and CC configurations of BJT. (8)
18. (a) Explain the construction and characteristics of enhancement MOSFET with neat sketch. (16)

Or

- (b) (i) Cascade amplifiers have high bandwidth. Validate this statement suitably. (6)
(ii) Explain in detail the construction, operation and characteristics of N-channel JFET. (10)
19. (a) Explain the general characteristics of negative feedback amplifiers represent: (i) Voltage series (ii) Voltage shunt (iii) Current series (iv) Current shunt feedback connection diagrammatically. (16)

Or

- (b) (i) Discuss in detail the common mode operation of differential amplifier with appropriate circuit diagram. (8)
(ii) Explain the operation of RC phase shift oscillator. (8)
20. (a) Explain about any four types of clippers. (16)

Or

- (b) (i) Explain the operation of monostable multivibrator and state its applications. (8)
(ii) Explain the working of UJT based saw tooth oscillator. (8)
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