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**Question Paper Code: 50335**

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

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 barrier potential of Silicon (Si) and Germanium (Ge) respectively are
  - 0.2 V and 0.7V
  - 0.3 V and 0.6 V
  - 0.7V and 0.3V
  - 0.6V and 0.2V
- Zener diode is operated in
  - Reverse breakdown region
  - Forward biased region
  - cut-off region
  - Reverse bias region
- Doping of emitter, base and collector are in the increasing order of
  - Emitter>Collector>Base
  - Collector >Emitter>Base
  - Emitter>Base>Collector
  - Base>Emitter>Collector
- Which transistor configuration is also known as emitter follower configuration
  - 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. If the channel length of the MOSFET is reduced then its threshold voltage will
- (a) Increase (b) Remains the same  
(c) Decrease (d) None of these
7. Power amplifiers are also called as
- (a) Large signal amplifiers (b) Voltage amplifiers  
(c) Small signal amplifiers (d) Current amplifiers
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. Astable multivibrator is also called as
- (a) Square wave generator (b) Triangular wave generator  
(c) Pulse circuits (d) None of these
10. Clipper circuits is used to convert
- (a) Sine wave to triangular wave (b) Sine wave to square wave  
(c) Triangular wave to sine wave (d) Square to triangular wave

PART - B (5 x 2 = 10 Marks)

11. Define knee voltage or cut-in voltage of a diode.
12. What is early effect? What are the consequences of it?
13. Give any two differences between BJT and FET.
14. State the Barkhausen criterion for oscillation.
15. What are the types of multivibrators?

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) Explain the working of zener diode as a shunt regulator. (16)
17. (a) Derive the expression for current gain, input impedance and voltage gain of a CE transistor amplifier. (16)

Or

- (b) Explain the switching characteristics of transistor with neat sketch. (16)
18. (a) Discuss in detail the construction and working of enhancement MOSFET and depletion MOSFET and draw its characteristics. (16)

Or

- (b) Describe the principle of operation of a p-channel JFET with necessary diagrams. (16)
19. (a) Explain the Hartley Oscillator with neat diagram. (16)

Or

- (b) Discuss in detail the common mode operation of differential amplifier with appropriate circuit diagram. (16)
20. (a) Explain the operation of a bistable multi-vibrator circuit with neat sketch. (16)

Or

- (b) Explain the working of UJT as a relaxation oscillator with necessary wave forms and equations. (16)
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