Reg. No. : | | | | | | | | | | |

Question Paper Code: 42407

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Second Semester

Electronics and Communication Engineering

14UEC207 - ELECTRONIC DEVICES

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Define Electron Volt.

   (a) 2eV (b) 1eV (c) 9eV (d) 7eV

2. The energy gap decreases with the ---------- in temperature

   (a) Constant (b) unity (c) decreases (d) increases

3. Mention any one application of Zener Diode.

   (a) detector (b) tunnel diode

   (c) For Controlling the output amplitude (d) demodulation circuit

4. Reverse resistance in the range of

   (a) MΩ (b) mΩ (c) KΩ (d) None of these

5. By providing proper bias voltage ,the transistor can be made to work as an------

   (a) amplifier (b) regulator (c) switch (d) diode

6. While using a BJT as an amplifier, the collector and emitter terminals get interchanged mistakenly. Assuming that the amplifier of common emitter amplifier the biasing is suitably adjusted, the interchange of terminals will result into which one of the following?

(a) Zero gain (b) Infinite gain
(c) Reduced gain (d) No change in gain at all

7. The effective channel length of a MOSFET in saturation decreases with increase in

(a) Gate voltage (b) Drain voltage
(c) Source voltage (d) Body voltage

8. Which mode JFET can operate----------

(a) depletion (b) enhancement

(c) depletion and enhancement (d) normal mode

9. A PIN diode is frequently used as a

(a) Peak clipper
(b) Voltage regulator
(c) Harmonic generator
(d) Switching diode for frequencies up to GHz range

10. LCD are used for display of

(a) printer (b) numeric only
(c) alphanumeric character only (d) numeric and alphanumeric character

PART - B (5 x 2 = 10 Marks)

11. Define mass action law.

12. What is Zener break down?

13. Why CE configuration is widely used in amplifier circuits? Give reason.

14. Write the equation for drain current of JFET.

15. State tunneling phenomenon.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Derive the expression for the carrier concentration in intrinsic semi conductor. (10)

(ii) Explain the variation in semiconductor parameter and temperature. (6)

Or

(b) (i) Derive expression of Drift and Diffusion current. (12)

(ii) Write short Notes on Mass action law. (4)

17. (a) With neat diagram and explain the theory of PN junction diode (16)

Or

(b) (i) With the help of a circuit diagram explain the working of a half-wave rectifier. Also draw the necessary waveforms. Also obtain the expression for the ripple factor and efficiency of rectification. (12)

(ii) Show that rectification efficiency for a half wave rectifier is 40.6%. (4)

18. (a) Explain about switch mode power supply and its operation. (16)

Or

(b) Explain the transistor characteristics in CE configurations. Explain the behavior of the transistor in active, cut-off and saturation mode. (16)

19. (a) Why JFET is called voltage controlled device? Draw the structure and output characteristics of P-channel JFET. Indicate different regions in the characteristics and explain its significance. (16)

Or

(b) Explain the construction and operation of N-channel JFET. (16)

20. (a) (i) With neat sketch explain the principle of Uni Junction Transistor (12)

(ii) Differentiate between photoconductive and photovoltaic cells. (4)

Or

(b) Write short notes on

(i) Phototransistor

(ii) Photodiode

(iii) Photoconductive sensor

(iv) Photovoltaic sensors (16)