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

Question Paper Code: 41527

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

Second Semester

Electronics and Instrumentation Engineering

14UEI207 - ELECTRONIC DEVICES AND CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. When a reverse bias is applied to a PN junction, the width of the depletion layer

(a) remains the same (b) is increased

(c) is decreased (d) may decrease or increase

2. Which of the following is a unipolar device?

(a) PN junction diode (b) Zener diode (c) Tunnel diode (d) Schottky diode

3. Field effect transistor has.

(a) large power gain (b) large input impedance

(c) large output impedance (d) small voltage gain

4. UJT is known as

(a) voltage controlled device (b) current controlled device

(c) relaxation oscillator (d) none of the above

5. Class AB operation is often used in power (large signal) amplifiers in order to

(a) get a maximum efficiency (b) remove even harmonics

(c) overcome cross over distortion (d) reduce collector dissipation

6. The common emitter amplifier is characterized by

(a) very high input impedance (b) signal phase reversal

(c) low voltage gain (d) very small leakage current

7. Oscillator use following feedback

(a) negative (b) positive (c) both negative and positive (d) none of the above

8. Crystal oscillator is used because

(a) it gives higher output voltage
(b) it has high efficiency
(c) the frequency of oscillations remains substantially constant
(d) it requires very low dc supply voltage

9. Without a DC source, a clipper acts like a

(a) clamper (b) chopper (c) rectifier (d) demodulator

10. Zener diode is used as the main component in dc power supply for

(a) rectification (b) voltage rectification
(c) filter action (d) both (a) and (b)

PART - B (5 x 2 = 10 Marks)

11. What is thermal runaway? How can it be avoided?

12. Compare JFET with BJT.

13. Distinguish between CE and CC amplifier.

14. State Barkhausen criterion for oscillation.

15. Mention the applications of clampers.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Explain in detail about junction capacitance. (8)

(ii) Draw the equivalent circuit of a tunnel diode and explain its characteristics. (8)

Or

(b) Explain in detail about different types of biasing circuits for BJT. (16)

17. (a) Explain the working of D-MOSFET, With the help of suitable diagrams, (16)

Or

(b) Draw the equivalent circuit of SCR using transistor. Explain the operation, characteristics and applications of SCR. (16)

18. (a) How Common Emitter transistor is modeled using h parameter and derive the expressions for input impedance, output impedance, voltage gain and current gain. (16)

Or

(b) Derive the efficiency for class B push pull amplifier and explain its operation with suitable diagrams. (16)

19. (a) Explain voltage series feedback amplifier and derive the expression for input and output resistance. (16)

Or

(b) Derive the frequency of oscillation of phase shift oscillator and explain its working. (16)

20. (a) Explain with the circuit diagram, the operation of monostable multivibrator using c transistors. Sketch input and output waveforms. (16)

Or

(b) (i) Draw the equivalent circuit of UJT and explain its operation with the help of emitter characteristics (10)

(ii) Explain " Lower" and " Upper" threshold voltages in Schmitt trigger. (6)

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