|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |

 **Reg. No. :**

**Question Paper Code: 42057**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 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. What is the value of the transition capacitance for a silicon diode when VD=0

(a) 1pF (b) 3 pF (c) 5 pF (d) 10 pF

2. Which of the following is a unipolar device?

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

3. The SCR can be triggered on by a pulse at the

 (a) gate (b) anode (c) cathode (d) none of the above

4. UJT is known as

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

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

5. Stability factor ‘S’ in fixed bias common emitter amplifier is given by

 (a) ß (b) ß + 1 (c) 1/ß+1 (d)1/ß

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. Feedback in an amplifier always helps to

 (a) control its output (b) increase its gain (c) decrease its input impedance (d) stabilize its gain

9. An op-amp clamper circuit is also referred as

 (a) DC cutter (b) DC inserter (c) DC lifter (d) DC leveller

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. Show the VI characteristics of a tunnel diode.

12. Compare JFET with BJT.

13. Define hybrid parameters.

14. State Barkhausen criterion for oscillation.

15. List any four applications of Schmitt trigger circuit.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Explain the working of transistor as an amplifier. (10)

 (ii) Derive the stability factor for a base bias circuit. (6)

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) Explain the structure, working and characteristics of N channel enhancement type MOSFET. (16)

18. (a) Draw the h-parameter equivalent circuit for a typical common emitter amplifier and derive the expression for Ai, Ri, Av and Ro. (16)

Or

 (b) Develop the expressions for input resistance, output resistance, current gain, voltage

 gain and power gain of CE and CB amplifiers. (16)

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

Or

(b) Explain RC phase oscillator and derive its frequency of oscillation. (16)

20. (a) With necessary waveforms, explain the full-wave bridge rectifier with and without filter. Also derive the necessary expressions. (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)