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Question Paper Code: 42507

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

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)

- Intrinsic semiconductor exhibits
 - large forbidden energy gap
 - small forbidden energy gap
 - No forbidden energy gap
 - forbidden energy gap
- Example for trivalent impurity is
 - Arsenic
 - Antimony
 - Indium
 - Bismuth
- A D-MOSFET differs from a JFET in the sense that it has no
 - channel
 - gate
 - P-N junctions
 - substrate
- If properly biased, JFET will act as a
 - current controlled current source
 - voltage controlled voltage source
 - voltage controlled current source
 - current controlled voltage source
- The decibel is a measure of
 - power
 - voltage
 - current
 - power level

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 amplifiers always helps to
- (a) control its output (b) increase its gain
- (c) decrease its input impedance (d) stabilize its gain
9. A bistable multivibrator
- (a) oscillates between two stable states without any trigger pulses
- (b) has three stable states
- (c) is used for generating square wave
- (d) has two stable states
10. Diode that is used to add or restore a DC level to an electrical signal is
- (a) clipper or limiter (b) clamper (c) zener diode (d) tunnel diode

PART - B (5 x 2 = 10 Marks)

11. Differentiate between avalanche and zener breakdown mechanisms.
12. The intrinsic stand-off ratio for a UJT is determined to be 0.60. A measurement of its interbase resistance indicates $7\text{ k}\Omega$. Calculate the UJT's static values of r_{B1} and r_{B2} .
13. Define hybrid parameters.
14. Draw the hybrid model of Common Emitter amplifier.
15. State the Barkhausen's criterion for oscillation.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the construction and working characteristics of PN diode with a neat sketch. (16)

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) Discuss the construction, working, characteristics and applications of Silicon Controlled Rectifier. (16)
18. (a) Draw the h-parameter equivalent circuit for a typical common emitter amplifier and derive the expression for A_i , R_i , A_v and R_o . (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) Discuss with circuit diagram and explain the working of Wein bridge oscillators (16)
- Or
- (b) Explain RC phase oscillator and derive its frequency of oscillation. (16)
20. (a) Explain the working of single phase centre tapped full wave rectifier (with and Without filter) with neat diagrams and derive the necessary equations. (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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