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Question Paper Code : 60526

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Third Semester

Electronics and Instrumentation Engineering

EI 2203/EI 35/EC 1209/080300002/10133 EE 305 — ELECTRONIC DEVICES AND
CIRCUITS

(Common to Instrumentation and Control Engineering)

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is varactor diode?
2. Define Stability factor.
3. Define pinch off voltage.
4. How can an SCR be turned 'ON' or 'OFF'?
5. What is an Emitter follower?
6. What is meant by power conversion efficiency of a power amplifier?
7. What are the merits of negative feedback?
8. 'Crystal oscillators possess an exceptionally high degree of frequency stability'. Justify.
9. Draw the circuit of Schmitt trigger.
10. What is meant by voltage regulation?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the behavior of PN junction diode under forward and reverse bias conditions. (8)
- (ii) Distinguish between Avalanche and Zener breakdown mechanisms. (8)

Or

- (b) What is bias stability? Draw and describe the working of self bias circuit for stabilizing the operating point. Analyze the circuit for its performance. What is load line? (16)
12. (a) (i) With neat sketch describe the working of a D-MOSFET. What is the relationship between the drain current and gate voltage? (8)
- (ii) What is SCR's? Draw a typical volt ampere characteristics for an SCR. Explain why you get such characteristics. (8)

Or

- (b) (i) What is the difference between a FET and a bipolar transistor? (4)
- (ii) Define the FET parameters and establish the relationship between them. (6)
- (iii) Explain the construction and working of UJT. (6)
13. (a) Draw the mid frequency equivalent circuit of a CE BJT amplifier and derive expressions for
- (i) Voltage gain
- (ii) Current gain
- (iii) Input Impedance and
- (iv) Output impedance. (16)

Or

- (b) (i) Show that the maximum possible power conversion efficiency of a double ended push pull Class B configuration is 78.5% (8)
- (ii) Explain how cross over distortion is produced. What measures will you adopt to prevent cross over distortion? (8)
14. (a) Explain with neat block diagrams all the possible topologies of feedback amplifier. Give example amplifier circuits for each type of feedback. (16)

Or

- (b) (i) State and explain Barkhausen's criterion for self sustained oscillations. (6)
- (ii) Draw the circuit of RC phase shift oscillator and explain its working. Derive the expression for frequency of oscillation. (10)

15. (a) (i) Draw the circuit of a biased positive clipper and explain with suitable waveforms. (8)
- (ii) Draw a high pass RC circuit and how it acts as a differentiator. (8)

Or

- (b) (i) Describe the working principle of a transistorized shunt voltage regulator with the help of a circuit diagram. (8)
- (ii) Explain the operation of a Schmitt trigger circuit and derive expressions for LTP and UTP. (8)
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