

B.Tech Degree III Semester Examination November 2012

CS/EB/EE 306 ELECTRONIC DEVICES AND CIRCUITS (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A (Answer *ALL* questions)

(8 × 5 = 40)

- I. (a) What is the need of filters in power supplies? Briefly explain various types of filters used in power supplies.
- (b) With the help of emitter characteristics, explain the working of UJT.
- (c) Define alpha and beta of a transistor. Derive the relationship between them.
- (d) Explain the need for biasing circuits.
- (e) State and explain Barkhausen criteria for oscillations. What is responsible for starting oscillations?
- (f) What are the advantages and features of class C amplifiers? Mention its applications.
- (g) Describe the operation of biased clipper and combinational clipper.
- (h) Draw and explain a bootstrap sweep circuit.

PART B

(4 × 15 = 60)

- II. (a) Describe the operation of transistorized series voltage regulator. (7)
- (b) Draw the circuit and waveforms of a bridge rectifier and derive the expression for the ripple factor. (8)
- OR**
- III. (a) Explain the difference between Zener breakdown and avalanche breakdown. (5)
- (b) With the help of V-I characteristics explain the principle of operation of PIN diodes. Mention its application. (5)
- (c) Explain the need for bleeder resistor in power supplies. (5)
- IV. (a) Draw the frequency response of RC coupled amplifier. Define and explain upper and lower cut off frequencies, bandwidth, mid frequency gain and gain bandwidth product. Also explain the factors affecting the frequency response. (10)
- (b) Explain how FET can be used as a voltage variable resistance. (5)
- OR**
- V. (a) Draw the equivalent circuit of a common source JFET amplifier with source unbypassed. Derive expression for the mid frequency voltage gain, input impedance and output impedance. (10)
- (b) Explain the concept of a.c. and d.c load line. (5)

(P.T.O)

- VI. (a) What are the four possible topologies for a feedback amplifier? Give the transfer gain A and feedback factor β for each topology. (10)
- (b) How are power amplifiers classified? Explain what is class A amplifier. (5)
- OR**
- VII. (a) What is cross-over distortion in power amplifier circuit and how it can be eliminated? (8)
- (b) Explain with a neat circuit diagram the working of a crystal oscillator. (7)
- VIII. (a) With suitable waveforms and circuit diagram explain the working of an astable multivibrator. (10)
- (b) With circuit and waveforms explain the working of a negative clamping circuit. (5)
- OR**
- IX. (a) Draw the circuit of an RC differentiating and integrating circuits and derive the expression for their outputs. (10)
- (b) Draw the output waveform of the given circuit for a sinusoidal input. Draw its transfer characteristics also. (5)

