

G 557

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Reg. No.....

Name.....

**B.TECH. DEGREE EXAMINATION, MAY 2014**

**Fourth Semester**

Branch : Electrical and Electronics Engineering

**ELECTRONIC CIRCUITS (E)**

(Old Scheme—Prior to 2010 Admissions)

[Supplementary/Mercy Chance]



Time : Three Hours

Maximum : 100 Marks

**Part A**

*Answer all questions.*

*Each question carries 4 marks.*

1. What is thermal runaway ? Explain any *two* methods to eliminate the same.
2. Draw the equivalent circuit of UJT and define intrinsic stand-off ratio.
3. Compare the four properties of CB and CE configurations.
4. Sketch the characteristics and indicate how  $h_{ib}$  and  $h_{fb}$  are estimated from them.
5. Distinguish between positive and negative feedback and give their applications.
6. Draw the electrical equivalent circuit of a crystal and identify the parameters.
7. Draw the circuit of a positive clipper using diodes and show how the level of clipping can be changed.
8. With a circuit, explain RC integrator and show how it works as a low-pass filter.
9. Prove that all the even harmonics are cancelled in a transformer coupled push-pull amplifier circuit.
10. Indicate the positions of Q-point on the load line for class A, B, AB and C. Compare their efficiencies.

(10 × 4 = 40 marks)

**Part B**

*Answer all questions.*

*Each full question carries 12 marks.*

11. Derive the expressions for the stability factor  $S_1$  for (i) Collector feedback bias ; (ii) Emitter feedback bias ; and (iii) Voltage divider bias.

*Or*

12. With neat circuit diagram, explain the working of self biased JFET amplifier. Show how it can amplify a weak voltage.

**Turn over**

13. Starting from fundamentals, derive the low frequency small signal  $h$ -parameters of a CB configuration and the equivalent circuit. Define the  $h$ -parameters of the above, giving typical values.

Or

14. Draw the two-stage RC coupled CE amplifier and derive the expression for its (i) overall input resistance ; and (ii) overall current gain.
15. With block diagram representation, derive the expression for  $R_{if}$ ,  $R_{of}$  and  $A_f$  of a current shunt feedback amplifier. Draw a circuit example.

Or

16. With a neat circuit diagram, explain how sustained oscillations are produced in a crystal oscillator. How the Barkhausen criteria are satisfied ?
17. Draw the circuit of an astable multivibrator using BJT to produce square wave of 600 Hz, 60 % duty cycle 0-6 V amplitude. Design the circuit and explain the working with the help of waveforms.

Or

18. Draw the circuit of UJT relaxation oscillator and explain the working with the help of waveforms. Design the circuit for generating sweep at 6V amplitude, 18.72 mS sweep trace and 1.28 mS retrace.
19. With a neat circuit diagram, describe the working of a complementary symmetry class AB power amplifier. Derive the expression for its power conversion efficiency.

Or

20. Describe the working of a class C power amplifier. How the distortion of its output is taken care of ? Explain with a circuit example.

(5 × 12 = 60 marks)

