D 42030 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, DECEMBER 2007

CS/IT 04 304—BASIC ELECTRONICS ENGINEERING

(2004 admissions)

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

1. (a) What is the principle of varactor diode ? Give its applications.
   (b) What are the typical parameters available in the data sheet of transistors ?
   (c) Compare the different rectifier circuits.
   (d) Briefly discuss the classification of amplifiers.
   (e) How harmonic distortion can be reduced in amplifier ?
   (f) Draw the circuits for :
      (i) – ve voltage shunt feedback amplifier.
      (ii) – ve current series feedback amplifier.
      (iii) – ve voltage series feedback amplifier.
      (iv) – ve current shunt feedback amplifier.
   (g) Draw and explain the block diagram of an Op-Amp. What is the need of level shifter in it. ?
   (h) What is the significance of the name "Op-Amp" ? What are the features of ideal Op-Amp ?

(8 × 5 = 40 marks)

2. (a) Briefly explain the amplifying action of transistor. (8 marks)
   (b) What do you mean by thermal runaway ? How to avoid that ? (7 marks)

Or

3. (a) Compare the different configurations of transistor. (5 marks)
   (b) Explain the working of UJT and give its application. (10 marks)

4. What do you mean by "operating point" ? What is the meaning of fixing the operating point ? What is its need ? Give an example to supplement your answer.

(15 marks)

Or

5. (a) What are the features of 'cascading' of amplifiers. (5 marks)
   (b) Draw the circuit of an RC coupled amplifier with voltage divider bias and explain the function of each component in the circuit.

(10 marks)

Turn over

6. (a) What do you mean by "power amplifier" ? Where it is used ? (5 marks)

   (b) Draw the circuit of crystal oscillator and explain the principle of operation. (10 marks)

Or

7. Draw and explain the circuit of Astable multivibrator with relevant waveforms. Derive its design equations. (15 marks)

8. (a) Design a circuit using Op-Amp to implement the function $Y = 0.3x_1 - 2x_2 + 5x_3$. (10 marks)

   (b) Give the physical meaning of CMRR. (5 marks)

Or

9. (a) Draw and explain the circuit using Op-Amp which can identify the polarity of the input wave. (6 marks)

   (b) Define the terms :

   (i) Slew rate.

   (ii) Output offset voltage.

   (iii) Bias current. (9 marks)

[4 × 15 = 60 marks]