Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

R 3289

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Fourth Semester

(Regulation 2004)

Electronics and Communication Engineering

EC 1251 — ELECTRONIC CIRCUITS — II

(Common to B.E. (Part-Time) Third Semester – Regulation 2005)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the characteristics of negative feedback amplifiers.

2. Addition of negative feedback to an amplifier reduces its voltage gain from 300 to 60. Determine the feedback factor.

3. If $L_1 = 1$ mH, $L_2 = 2$ mH and $C = 0.1$ nF, what is the frequency of oscillation of the Hartley oscillator?

4. What is the principle behind operation of a crystal oscillator?

5. Mention two applications of tuned amplifiers.

6. What are the differences between single tuned and synchronously tuned amplifiers?

7. Sketch the output waveform of a differentiating circuit with square wave input for RC = PW and RC = PW/10.

8. Draw the circuit diagram of a negative voltage clamper and plot its output for a sinusoidal input.

9. What is a blocking oscillator?

10. Write the equation used to determine sweep frequency of a UJT relaxation oscillator. Calculate the frequency with $R = 100$ kΩ, $C = 0.4$ μF and intrinsic stand off ratio 0.57.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Show how negative feedback reduces gain of an amplifier. (8)

    (ii) Explain the effect of negative feedback on the input resistance for a voltage shunt feedback amplifier. (8)

Or

   (b) Draw the circuit diagram of an amplifier with current series feedback. Derive the expressions for gain, input and output resistances with feedback. (16)

12. (a) (i) Explain the Barkhausen criterion to be satisfied for sustained oscillations. (6)

    (ii) Draw the circuit diagram of a Wien bridge oscillator and obtain an expression for frequency of oscillation. (10)

Or

   (b) (i) Explain the operation of a Colpitt's oscillator and derive an expression for its frequency of oscillation and condition for sustained oscillation. (14)

    (ii) If C_1 and C_2 are 200 pF and 50 pF respectively. Calculate the value of inductance for producing oscillations at 1 MHz in the Colpitt's oscillator circuit. (2)

13. (a) Draw the circuit diagram of a single tuned amplifier and obtain expression for its gain. (16)

Or

   (b) What is the need for neutralization in tuned amplifiers? Explain a narrow band and a broad band neutralization methods used. (16)

14. (a) Draw the circuit of a collector-coupled transistor astable multivibrator. Sketch the base and collector waveforms and explain the circuit operation. (16)

Or

   (b) (i) Sketch the circuit of a bistable multivibrator and explain the circuit operation. (10)

    (ii) Explain the methods of base triggering of a bistable multivibrator. (6)

15. (a) Draw the circuit of a transistor bootstrap ramp generator and explain how the circuit operates. (16)

Or

(b) (i) Draw the circuit of a current time base generator. Explain the working of the circuit with associated waveforms. (12)

(ii) Define the following terms with respect to a time base signal :

sweep time and flyback time. (4)