

**FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2006**

EE 04 404—ELECTRONICS—II

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

- I. (a) State and derive the conditions for oscillation.
- (b) Why positive feedback is generally not applied in amplifiers ? Compare the features of the types of feedback.
- (c) Explain the following :—
- (i) Virtual short.
- (ii) GBW product.
- (d) Define voltage regulation. What are the types of regulator ? Explain the principle of a simple regulator.
- (e) Explain the applications of PLL in signal reconstruction.
- (f) Give an account on 'FSK Demodulator'.
- (g) What are the parameters of DAC ? Define and explain them.
- (h) Draw a simple wave shaping circuit using R and C and explain its principle.
- (8 × 5 = 40 marks)
- II. (a) Draw a neat circuit diagram of Wien-bridge oscillator. Explain its principle of operation. Derive the condition for oscillation and an expression for resonant frequency.
- (15 marks)
- Or*
- (b) Compare and explain in detail the parameters of all four feedback topologies with neat sketches.
- (15 marks)
- III. (a) (i) Explain the properties of practical op-amps. (7 marks)
- (ii) Draw neat circuit diagrams for op-amp subtractor and op-amp differentiator. Explain them. Derive expressions for their output voltages. (8 marks)
- Or*
- (b) (i) Draw an op-amp regenerative comparator and explain. (7 marks)
- (ii) Explain the principles of VCO with a neat block diagram. (8 marks)

IV. (a) (i) Draw a neat circuit diagram of precision full wave rectifier using op-amp and explain the principle. Derive the expressions.

(7 marks)

(ii) Draw Op-amp divider circuit and explain. Derive an expression for its output voltage.

(8 marks)

Or

(b) (i) Give an account on 'Filter Transformation'.

(7 marks)

(ii) Design an Op-amp high pass filter with $f_c = 2$ kHz. Draw the circuit diagram.

(8 marks)

V. (a) (i) Draw a neat sketch of Op-amp sample and hold circuit. Explain its principle of operation. Draw the waveforms.

(10 marks)

(ii) Differentiate DAC from ADC.

(5 marks)

Or

(b) Write Technical notes on :

(i) ADC Quantizer characteristics:

(7 marks)

(ii) Counter ramp ADC.

(8 marks)

[4 × 15 = 60 marks]