Roll No. .....

3222

B. Tech. 5th Semester (ECE) (Elective-I) Examination – March, 2021

LINEAR APPLICATIONS

Paper : PEC-ECE- 313-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting ***one*** question from each Unit. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Answer the following in brief : $2.5 \times 6 = 15$

(a) What is level translator ?

(b) Give ideal characteristics of Op-Amp.

(c) What is peaking Op-Amp ? equivalent circuit.

(d) Explain summing and scaling Op-Amp. equivalent circuit.

(e) Explain high frequency Op-Amp. equivalent circuit.

(f) Explain basic differentiator.

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UNIT – I

2. Explain working of differential amplifier. Derive equation for DC analysis, AC analysis for single input balanced output differential amplifier. 15

3. (a) Explain the concept of current mirror. 5

   (b) Explain practical characteristics of Op-Amp. 10

UNIT – II

4. Explain voltage shunt feedback amplifier. Derive equation for closed loop voltage gain, input resistance and output resistance. 15

5. (a) Write note on features of compensating networks. 5

   (b) What is slew rate ? What are its causes ? Derive slew rate equation. 10

UNIT – III

6. (a) Explain instrumentation amplifier. 10

   (b) Write note on differential input and output amplifier. 5

7. (a) Explain frequency response of basic and practical integrator. 10

(b) Explain voltage to current converter. 5

UNIT – IV

8. Explain pin diagram and internal structure working of 555 timer. 15

9. (a) Explain astable operation of 555 timer. 10

(b) Explain block diagram of PLL. 5

Roll No. .....

3222

B. Tech. (ECE)-(Elective-I) 5th Semester Examination – February, 2022

LINEAR APPLICATIONS

Paper : PEC-ECE-313-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. 1 is ***compulsory***. Attempt any *one* question each from **Unit-I** to **Unit-IV**.

1. (a) What are current mirrors ?

(b) What is a compensating network ?

(c) Explain voltage to current converter.

(d) What is instrumentation amplifier ? Give circuit diagram.

(e) What are the causes of slew rate ?

(f) What is input offset voltage and CMRR ?

$2.5 \times 6 = 15$

UNIT – I

2. Explain working of differential amplifier. Derive equation for DC analysis and AC analysis for dual input, balanced output differential amplifier. 15

3. (a) Explain the concept of level translator. 5

(b) Give characteristics of ideal Op-Amplifier. 5

(c) Explain block diagram of Op-Amp. 5

UNIT – II

4. Explain voltage series feedback amplifier. Derive equation for closed loop voltage gain, input resistance and output resistance. 15

5. Explain high frequency Op-Amp equivalent circuit. What are the sources of capacitive effects ? Derive equation for voltage gain as a function of frequency. 15

UNIT – III

6. (a) Explain frequency response of basic and practical differentiator. 10

   (b) Write note on peaking and summing amplifier. 5

7. What are active filters ? Derive equation of voltage gain for first order low pass butterworth filter. Write filter design steps. 15

UNIT – IV

8. Explain pin diagram and internal structure working of 555 timer. 15

9. (a) Explain monostable operation of 555 timer. 10

   (b) Explain operating principle of PLL. 5
