

**III B. Tech I Semester Regular Examinations, November - 2015****LINEAR IC APPLICATIONS**

(Common to ECE, EIE and ECompE)

Time: 3 hours

Max. Marks: 70

---

 Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory3. Answer any **THREE** Questions from **Part-B**

\*\*\*\*\*

**PART -A**

- 1 a) Define differential amplifier and draw its block diagram. [3M]  
 b) Define CMMR and give its ideal and practical values. [4M]  
 c) Draw the non inverting op-amp circuit diagram and derive its output voltage. [3M]  
 d) Draw the circuit diagram of all pass filter and write its output voltage equation. [4M]  
 e) Draw the pin diagram of IC 555 and explain each pin. [4M]  
 f) List out different Analog to digital convertors and justify which A/D convertor is best in terms of speed. [4M]

**PART -B**

- 2 a) Derive the Differential Amplifier- AC analysis of single input dual output Configuration in detail. [8M]  
 b) Explain the concept of level translator in detail. [8M]
- 3 a) Explain the terms (i) slew rates (ii) CMRR (iii) PSRR (iv) drift and list out ideal and practical characteristics of above parameters. [8M]  
 b) Explain the operation of Op-amp along with block diagram in detail. [8M]
- 4 a) Draw the circuit diagram of differentiator by using IC 741 and explain its operation. [8M]  
 b) Explain the summer and difference amplifier using IC 741 and explain its operation. [8M]
- 5 a) Draw the block diagram of Sample & Hold amplifier and explain its operation in detail. [8M]  
 b) Explain the operation of 2<sup>nd</sup> order band reject filter along with circuit diagram. [8M]
- 6 a) Draw and Explain the principles and description of individual blocks of PLL in detail. [8M]  
 b) Explain the terms frequency multiplication, frequency translation of PLL. [8M]
- 7 a) Draw the block diagram of inverted R-2R DAC and explain its operation in detail. [8M]  
 b) List out the DAC and ADC Specifications and compare them in detail. [8M]

\*\*\*\*\*

**III B. Tech I Semester Regular Examinations, November - 2015**  
**LINEAR IC APPLICATIONS**  
 (Common to ECE, EIE and ECompE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

\*\*\*\*\*

**PART -A**

- |   |   |      |
|---|---|------|
| 1 | a) Explain the purpose of level translator in differential amplifier.         | [3M] |
|   | b) Draw the op-amp block diagram and explain the functions of each block.     | [4M] |
|   | c) Draw the integrator circuit and derive its output equation.                | [3M] |
|   | d) Define filters and draw the output characteristics of LPE and BPF filters. | [4M] |
|   | e) Draw the functional block diagram of IC 555 in detail.                     | [4M] |
|   | f) Define the terms Linearity and accuracy of A/D convertors.                 | [4M] |

**PART -B**

- |   |  |      |
|---|--|------|
| 2 | a) Derive the Differential Amplifier- AC analysis of Dual input single output Configuration in detail. | [8M] |
|   | b) Explain the Properties of other differential amplifier configuration in detail.                     | [8M] |
| 3 | a) Explain the Frequency Compensation techniques of op-amp in detail.                                  | [8M] |
|   | b) Draw the IC 741 op-amp pin diagram and explain the function of each pin in detail.                  | [8M] |
| 4 | a) Draw the block diagram of log Amplifiers and explain its operation in detail.                       | [8M] |
|   | b) What are the limitations of log amplifier and how to overcome those limitations explain in detail.  | [8M] |
| 5 | a) Draw the block diagram of Four Quadrant multiplier and explain its operation in detail.             | [8M] |
|   | b) Draw the 2 <sup>nd</sup> order band pass filter and draw its frequency response in detail.          | [8M] |
| 6 | a) Draw the astable applications of Schmitt Trigger and explain its operation in detail.               | [8M] |
|   | b) Draw the circuit diagram of FSK demodulators and explain its operation in detail.                   | [8M] |
| 7 | a) Draw the block diagram of dual slope ADC and explain its operation in detail.                       | [8M] |
|   | b) Draw the circuit diagram of weighted resistor DAC and explain its operation in detail.              | [8M] |

\*\*\*\*\*

**III B. Tech I Semester Regular Examinations, November - 2015**  
**LINEAR IC APPLICATIONS**  
 (Common to ECE, EIE and ECompE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

\*\*\*\*\*

**PART -A**

- |   |  |      |
|---|--|------|
| 1 | a) Draw the differential amplifier block diagram and list out each block name. | [3M] |
|   | b) List out ideal and practical characteristics of Op-amp.                     | [4M] |
|   | c) Draw the precision rectifier circuit diagram.                               | [3M] |
|   | d) List out the applications of analog switches.                               | [4M] |
|   | e) Draw the block diagram of PLL and list out each block name.                 | [4M] |
|   | f) What are the basic DAC techniques?  | [4M] |

**PART -B**

- |   |  |      |
|---|--|------|
| 2 | a) Derive the Differential Amplifier- DC analysis of Dual input Balanced output Configuration in detail. | [8M] |
|   | b) Explain the concept of Cascade Differential Amplifier Stages in detail.                               | [8M] |
| 3 | a) Explain the IC 741 op-amp block diagram & its features in detail.                                     | [8M] |
|   | b) List out the applications and Temperature ranges of IC 741 Op-amp.                                    | [8M] |
| 4 | a) Explain the operation of Square wave generators along with circuit diagram.                           | [8M] |
|   | b) Draw the block diagram of Non- Linear function generation and explain its operation.                  | [8M] |
| 5 | a) Draw the block diagram of balanced modulator and explain its operation in detail.                     | [8M] |
|   | b) Draw the 2nd order band pass filter and explain its operation in detail.                              | [8M] |
| 6 | a) Draw the block diagram of Astable operations using IC 555 and derive its time constant.               | [8M] |
|   | b) Draw the circuit diagram of VCO 566 and explain its operation.  | [8M] |
| 7 | a) Draw the block diagram of successive approximation ADC and explain its operation in detail.           | [8M] |
|   | b) Draw the circuit diagram of counter type ADC and explain its operation in detail.                     | [8M] |

\*\*\*\*\*

**III B. Tech I Semester Regular Examinations, November - 2015**  
**LINEAR IC APPLICATIONS**  
 (Common to ECE, EIE and ECompE)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**

\*\*\*\*\*

**PART -A**

- |   |  |      |
|---|--|------|
| 1 | a) Explain different properties of differential amplifier. | [3M] |
|   | b) Explain different Package Types of op-amps.             | [4M] |
|   | c) Draw the V to I and I to V convertor.                   | [3M] |
|   | d) List out the features of IC 1496 balanced modulator.    | [4M] |
|   | e) What are the various applications of VCO 566?           | [4M] |
|   | f) List out the DAC and ADC specifications in detail.      | [4M] |

**PART -B**

- |   |  |      |
|---|--|------|
| 2 | a) Draw the dual input and dual output differential amplifier and derive its ac characteristics in detail.       | [8M] |
|   | b) Draw the circuit diagram of level translator and explain its operation in detail.                             | [8M] |
| 3 | a) Explain different frequency compensation techniques of op-amp in detail.                                      | [8M] |
|   | b) Explain the terms (i) Input & Out put Off set voltages & currents, (ii) slew rates, (iii) CMRR and (iv) PSRR. | [8M] |
| 4 | a) Draw the Instrumentation amplifier and explain its operation in detail.                                       | [8M] |
|   | b) Draw the Anti log Amplifiers circuit diagram and derive its output voltage in detail.                         | [8M] |
| 5 | a) Draw the circuit diagram of Sample & Hold amplifier and explain its operation in detail.                      | [8M] |
|   | b) Draw the circuit diagram of All pass filters and derive its output response.                                  | [8M] |
| 6 | a) Draw the circuit diagram of Monostable multivibrator by using IC 555 timer and explain its operation.         | [8M] |
|   | b) Draw the block diagram of PLL and explain the operation of individual blocks in detail.                       | [8M] |
| 7 | a) Draw the block diagram of parallel Comparator type ADC and explain the operation of it.                       | [8M] |
|   | b) Draw the block diagram of R-2R ladder DAC and explain its operation.  | [8M] |

\*\*\*\*\*

||'||'||'||'||