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C20-AEI-402

**7414**

**BOARD DIPLOMA EXAMINATION, (C-20)**

**JUNE/JULY—2022**

**DAEI - FOURTH SEMESTER EXAMINATION**

**LINEAR INTEGRATED CIRCUITS**

Time : 3 hours ]

[ Total Marks : 80

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**PART—A**

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. State any three requirements of an operational amplifier.
2. List any three specifications of ideal operational amplifier.
3. Draw the voltage follower circuit using operational amplifier.
4. Draw the circuit diagram of ideal differentiator circuit using operational amplifier.
5. List any three disadvantages of passive filters.
6. Draw the ideal frequency response plots of LPF and BPF.
7. What are the packages of 555 IC?
8. What is the function of trigger pin in 555 IC?
9. Define lock in range and capture range in PLL.
10. List any three applications of PLL.

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**PART—B**

8×5=40

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **eight** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

**11.** (a) Explain the block diagram of typical integrated circuit operational amplifier.

**(OR)**

(b) Explain the operation of differential amplifier.

**12.** (a) Explain the operations of inverting and non-inverting amplifiers using operational amplifier.

**(OR)**

(b) Explain the operation of instrumentation amplifier using operational amplifier.

**13.** (a) Explain the operation of first-order LPF using operational amplifier with its frequency response.

**(OR)**

(b) Explain the operation of first-order HPF using operational amplifier with its frequency response.

**14.** (a) Explain the operation of 555 IC timer with diagram.

**(OR)**

(b) Explain the operation of astable multivibrator using IC 555.

**15.** (a) Explain the operation of Schmitt trigger circuit with its waveforms.

**(OR)**

(b) Explain the operation of square wave generator using operational amplifier.

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**PART—C**

10×1=10

- Instructions :** (1) Answer the following question.  
(2) The question carries **ten** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 16.** Draw the circuit of triangular wave generator and explain its operation.

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