

**BACHELOR OF VOCATION**  
**Robotics and Automation**  
**Subject: Linear Integrated Circuits**  
**Subject Code: DBEC-301**  
**Semester: Fifth**  
**January 2021**  
**Theory (External): 35 Marks**  
**Time: 03 Hours**

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**Instructions to the Students**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

**Roll Number**

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## SECTION –A (SHORT/OBJECTIVE TYPE QUESTIONS)

(10x1=10 Marks)

- A. Can we cascade more than two stages to achieve a higher gain of OP-AMP? Explain
- B. Explain how an op amp can be tested by using it as a buffer amplifier
- C. What is a sample and hold circuit? Where it is used?
- D. Draw equivalent circuit and voltage transfer characteristics of an op-amp
- E. Mention the drawbacks of a Source Follower.
- F. Explain about charge injection error.
- G. Explain the effect of negative feedback on the frequency response of OP-AMP.
- H. Explain the differential non-linearity error in brief.
- I. Describe the concept of virtual ground and virtual short.
- J. Explain why open loop op amp configurations are not used in linear applications



## SECTION – B (ESSAY TYPE QUESTIONS)

(5×5 = 25 Marks)

1. Draw the circuit for differential amplifier with current source load and explain its operation.
2. Draw and explain the Nyquist rate D/A converter using binary sealed converter.
3. Draw the circuit of a V-I converter and derive an expression for the output current in terms of input voltage.
4. Explain and derive the condition for DC-characteristics of an operational amplifier.
5. Explain how a comparator can be used as a zero crossing detector.
6. What is CMRR? Explain diode compensation technique for improving CMRR for emitter coupled differential amplifier
7. Explain the analog multiplier using emitter coupled transistor technique and also mention its applications.
8. What is PLL? Derive the expression for capture range and lock range of PLL.

**==END OF PAPER==**