

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject Code: 130902****Date: 23-12-2014****Subject Name: Analog and Digital Electronics****Time: 02.30 pm - 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What are ideal characteristics of operational amplifier? **07**
 (b) Explain block diagram of op-amp. Explain function of each block. **07**
- Q.2** (a) Explain inverting, noninverting and differential amplifier using op-amp under open loop condition. **07**
 (b) Derive equation of gain for voltage series feed-back for op-amp. **07**
- OR**
- (b) Draw pin diagram of op-amp. Explain function of each pin. Explain different packages are used for op-amp IC. **07**
- Q.3** (a) Explain application of op-amp as integrator and differentiator. **07**
 (b) What is the importance of slew rate and output offset voltage in operation of op-amp? **07**
- OR**
- Q.3** (a) What are demerits of open loop configuration of op-amp? How can we overcome this? **07**
 (b) Explain differential amplifier using three op-amp. Derive its gain equation. **07**
- Q.4** (a) Why NAND gate and NOR gate is known as universal gate? Obtain AND and OR gate using NAND and NOR gate. **07**
 (b) Explain working of IC 555 as astable multivibrator. **07**
- OR**
- Q.4** (a) Explain pin diagram of IC 555. Explain function of each pin. **07**
 (b) Explain half adder and full adder circuit. **07**
- Q.5** (a) Explain R-S flip-flop using truth table. **07**
 (b) Explain role of multiplexer and demultiplexer in digital electronics. Explain with diagram. **07**
- OR**
- Q.5** (a) How can be obtained 1's and 2's complement of binary number? **07**
 (b) Explain working of counter and register. **07**
