

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER- III EXAMINATION – SUMMER 2015****Subject code: 130902****Date: 29/05/2015****Subject Name: ANALOG AND DIGITAL ELECTRONICS****Time: 02.30pm-05.00pm****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) Derive the gain and input resistance for equation for dual input and unbalanced output differential amplifier. **07**
- (b) Explain block diagram of op-amp. What are the ideal characteristics of opamp? **07**

- Q.2** (a) Derive gain, input resistance and output resistance equation for voltage series feedback for op-amp. **07**
- (b) Derive the following term regarding op-amp: **07**
- 1) Input bias current 2) Input offset current 3) CMRR 4) PSSR
5) Slew rate 6) Output offset voltage 7) Differential gain.

OR

- (b) Explain the differential amplifier using two op-amp. Derive its gain equation. **07**
- Q.3** (a) Explain pin diagram of IC 555. Explain function of all pins. **07**
- (b) Explain three pin voltage regulator IC. Explain LM 78XX and LM 79XX. **07**

OR

- Q.3** (a) Subtract (a) $69_{16}-43_{16}$ (b) $27_{16}-73_{16}$ using the 2's complement arithmetic. **07**
- (b) Explain AND and OR gate using diode and transistor circuit. **07**

- Q.4** (a) Explain De Morgan's theorem. **07**
- (b) Explain Full adder and Half adder circuit **07**

OR

- Q.4** (a) Explain three variables and four variables K-map. **07**
- (b) Explain NAND gate S-R Flip flop. **07**

- Q.5** (a) Explain J-K flip-flop and Master Slave J-K flip-flop. **07**
- (b) Explain Multiplexer and De-multiplexer. **07**

OR

- Q.5** (a) Explain Astable Multivibrator using IC 555. **07**
- (b) Explain Adder and Subtractor using operational amplifier. **07**
