

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**
