

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (OLD) EXAMINATION – WINTER 2017****Subject Code:130902****Date:14/11/2017****Subject Name: Analog and Digital Electronics****Time: 10:30 AM to 01:00 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) List and discuss all ideal characteristics of an Op-Amp. **07**
 (b) Explain with the help of circuit diagram the operation of an Op-Amp inverting amplifier. Derive an expression for the voltage gain of this amplifier. **07**
- Q.2** (a) Write a short note on Integrator. **07**
 (b) Explain the working of IC 555 as a bistable multivibrator. **07**
- OR**
- (b) Explain the operation of dual slope ADC and state its advantages. **07**
- Q.3** (a) Draw the typical connection diagram of 78xx regulator series and explain the function of each and every component in the circuit. **07**
 (b) (i) Explain the De-Morgan's theorem. **07**
 (ii) Write a note on Duality theorem.
- OR**
- Q.3** (a) (i) Reduce the expression using Boolean laws $A\bar{B}C + B + B\bar{D} + AB\bar{D} + \bar{A}C$ **07**
 (ii) Add -75 to +26 using the 8 bit 2's complement arithmetic.
 (iii) convert $5C7_{16}$ to decimal.
 (b) Reduce using K mapping the expression $\sum m (0,1,2,3,5,7,8,9,10,12,13)$ and implement it in universal logic. **07**
- Q.4** (a) Explain priority encoder with help of truth table, K-map and AOI implementation. **07**
 (b) Compare between TTL and CMOS logic. **07**
- OR**
- Q.4** (a) Explain with diagram and truth table the operation of 4:1 Multiplexer. **07**
 (b) Derive full adder with the help of necessary truth table, K-map. Also express in AOI logic diagram. **07**
- Q.5** (a) Write a short note on parallel in serial out shift register. **07**
 (b) Explain the working of Master Slave J-K flip flop. **07**
- OR**
- Q.5** (a) Explain with the truth table the working of R-S flip flop. **07**
 (b) What is the difference between synchronous counter and asynchronous counter? **07**
