

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER-III • EXAMINATION – SUMMER.2015

Subject Code: X30902**Date: 01/06/2015****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) List and explain characteristics of an ideal OP AMP. **07**
 (b) State and prove D'morgan's theorem with necessary truth table. **07**

- Q.2** (a) Why NAND and NOR gate are used as universal gate? Obtain AND and OR gate using NAND and NOR gate. **07**
 (b) Explain J K flip flop with necessary truth table. **07**

OR

- (b) Explain R S flip flop with necessary truth table. What is race around condition? How to overcome it? **07**

- Q.3** (a) Do as directed **07**
 $(365.24)_8 = (\quad)_{10}$
 $(105)_{10} = (\quad)_2$
 $(1011.01)_2 = (\quad)_{10}$
 $(364)_8 = (\quad)_2$
 $(AFB2)_{16} = (\quad)_2$
 $(111)_{16} = (\quad)_2$
 $(FFFF)_{16} = (\quad)_2$
 (b) Minimize using K map. **07**
 $Y = \sum m(1,3,5,9,11,13)$

OR

- Q.3** (a) Minimize using K map. **07**
 $Y = \sum m(1,3,7,11,15) + d(0,2,5)$
 (b) Explain gray code in detail and list its applications. **07**

- Q.4** (a) Explain zero crossing detector circuit with necessary waveforms. **07**
 (b) Draw pin diagram of IC 555 timer and explain function of each pin. **07**

OR

- Q.4** (a) Explain practical integrator circuit using OP AMP with necessary waveforms. **07**
 (b) Explain D flip flop with necessary truth table **07**

- Q.5** (a) Write short note on TTL logic family. **07**
 (b) Classify the registers according to mode of operation & explain any one in detail. **07**

OR

- Q.5** (a) Define encoder, decoder, multiplexer and demultiplexer. Give application of each. **07**
 (b) What is schmitt trigger? Explain in detail. **07**
