

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-III EXAMINATION – SUMMER 2016**

**Subject Code: X30902****Date: 30/05/2016****Subject Name: Analog & Digital Electronics****Time: 02:30 PM to 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) Draw and explain OPAMP as an inverting amplifier with necessary sketches and equations. **07**  
 (b) Enlist different types of frequency compensations techniques. Explain any one method with necessary diagram. **07**
- Q.2** (a) Draw and explain Pin diagram of 555 IC? **07**  
 (b) Write a short note on OPAMP as a Zero Crossing Detector with necessary circuit diagram and waveforms? **07**
- OR**
- (b) Write a short note on OPAMP as a Integrator with necessary circuit diagram and waveforms? **07**
- Q.3** (a) State and explain De-Morgan's theorem with suitable examples. **08**  
 (b) Given the binary numbers  $a = 10101.1$ ,  $b = 101.01$  and  $c = 1001.1$ . Perform the following binary operation. (a)  $a + c$  (b)  $a - b$  (c)  $a \times c$  **06**
- OR**
- Q.3** (a) Explain following terms with suitable example:  
 1. Min term, 2. Max term, 3. POS, 4. SOP **08**  
 (b) In a new number system X and Y are successive digits such that  $(XY)_r = 29$  and  $(YX)_r = 34$ . Find X, Y, r. **06**
- Q.4** (a) Draw and explain BCD to seven segment Decoder with truth table. **07**  
 (b) Enlist different types of digital logic family. Explain any one with necessary diagram. **07**
- OR**
- Q.4** (a) Draw logic circuit of a 4:1 multiplexer and explain its working. **07**  
 (b) Draw and explain full subtractor with necessary circuit diagram and truth table. **07**
- Q.5** (a) Explain working of a master slave JK flip-flop with logic diagram. **07**  
 (b) Sketch the logic diagram of unidirectional shift register & explain its operation. **07**
- OR**
- Q.5** (a) What is the difference between Synchronous & Asynchronous counter? Explain with suitable example. **07**  
 (b) Use Karnaugh map to Simplify: **07**  

$$f(A, B, C, D) = \sum m(0, 2, 3, 6, 8, 9, 12, 14) + \sum d(1, 4, 10, 11)$$

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