

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-III Examination-Dec.-2011

Subject code: 130902

Date: 15/12/2011

Subject Name: Analog & Digital Electronics

Time: 2.30 pm -5.00 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)** How Op-amp connected in inverting mode and non inverting mode with feedback will act as averaging amplifier? What is the difference in averaging amplifier in this two modes? **07**
- (b)** Draw and explain the equivalent circuit of an Op-amp and explain ideal voltage transfer curve. **07**

- Q.2 (a) (i)** Explain voltage follower and inverter using Op-amp. **07**
- (ii)** What is CMRR? What is effect of frequency on CMRR?

- (b)** Explain integrator with its frequency response. **07**

OR

- (b)** Enlist the applications of 555 timer in astable and monostable mode. How IC 555 can be operated in astable mode? **07**

- Q.3 (a)** Do as directed:- **07**
- I. Convert the following decimal to binary.
(i)145 (ii) 23 (iii) 121
 - II. $(237)_8 = (\quad)_{10}$
 - III. Convert the following binary to octal.
(i)10111.011 (ii) 10110 (iii)1011.101

- (b)** Explain RTL and I^2R logic families. **07**

OR

- Q.3 (a)** Do as directed:- **07**
- I. Convert the following decimal to BCD equivalent.
(i)35 (ii) 174 (iii) 2469
 - II. Convert the following Binary to Gray Code.
(i)1001 (ii)1010(iii) 1110
 - III. Give the full form of ASCII code.

- (b)** Do as directed :- **07**
- I. Find the XS-3 code of following decimal numbers.
(i)24 (ii) 48 (iii) 62
 - II. $(6AC)_{16} = (\quad)_{10} = (\quad)_2$
 - III. Solve the following using 1's compliment.
(i)(-2)-(-3) (ii) (-19)-(-32)

Q.4 (a) Translate the following algebra into its logic equivalent and comment on the necessity of simplification. **07**

i. $F = A.B + \overline{B.C}$

ii. $F = (A + \overline{C})(\overline{A} + B) + (\overline{B} + C)(\overline{A.C})$

(b) Simplify the following. **07**

i. $F = \overline{(A.B)(B.C)(C.D)}$

ii. $F = (A + \overline{B} + AB)(A + \overline{B})(\overline{AB})$

OR

Q.4 (a) Using K-map technique simplify the following using minimum numbers of gates. **07**

$$F = m_0 + m_1 + m_4 + m_6 + m_8 + m_9 + m_{12} + m_{14}$$

(b) Apply De Morgan's theorem to solve the following. **07**

i. $\overline{(A + B + C)D}$

ii. $\overline{AB + \overline{CD} + EF}$

Q.5 (a) Explain clocked J-K flip flop with its symbol and truth table in rising as well as falling edge mode. Also draw waveforms. **07**

(b) Define decoders, multiplexer and de-multiplexer Give application of each. **07**

OR

Q.5 (a) Explain clocked D-flip flop with its symbol and truth table in rising and falling edge mode. Also draw the waveforms. **07**

(b) Define Register. Give its classifications. Explain any one classification. **07**
