Dr Meenakshi

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- December-2018

B.Tech III Semester

COURSE CODE: **10B11EC401**

COURSE NAME: **DIGITAL ELECTRONICS** MAX. MARKS: **35**

COURSE CREDITS: **04**

MAX. TIME: **Two Hours**

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. a) Differentiate between Moore and Mealy machines
   b) What is race around condition? How is it eliminated?
   c) Convert decimal 2142 in BCD **[CO2] [3]**

2. A sequential circuit uses two JK flip-flops as memory elements. The behavior of the circuit is described by the following equations:

   $J_A = B,\ K_A = \overline{X},\ J_B = \overline{X}.B,\ K_B = A \oplus X,\ Y = A \oplus B$

   Derive the state table and draw the state diagram of the circuit. **[CO3] [7]**

3. Draw the logic diagram of a four bit register with four D flip flops and four 4: 1 multiplexers with mode selection inputs s_1 and s_0. The register operates **[CO4] [5]**

S_1	S_0	Register Operation
0	0	No change
0	1	Complement the four outputs
1	0	Clear register to 0 (synchronous with the clock)
1	1	Load parallel data

4. Design a sequential circuit using D flip flop that goes through states 0, 1, 2, 4, 0. The undesired (unused) states must always go to zero (000) on the next clock pulse. **[CO4] [5]**

5. a) Draw the logic diagram of a MOD – 10 count up Ripple counter **[CO5] [2.5]**
   b) Design a circuit which will convert an S-R flip flop to JK flip flop **[2.5]**

6. Design a circuit which detects the decimal numbers 4 through 11 in 4 bit binary code input using AOI logic. Give any two applications of the circuit. **[CO6] [5]**

7. For the given multiplexer, derive the Boolean expression and realize it with any universal gate. **[CO6] [5]**