



### SEVENTH SEMESTER B.Tech. (E & C) DEGREE END SEMESTER EXAMINATION

NOV/DEC 2017

SUBJECT: RTL Verification using Verilog (ECE - 4021)

TIME: 3 HOURS

MAX. MARKS: 50

#### Instructions to candidates

- Answer **ALL** questions.
- Missing data may be suitably assumed.

- 1A. Apply Hu algorithm for the given data flow graph shown in Fig.1. Assume  $\gamma=4$ ,  $P(0)=1, P(1)=3, P(2)=4, P(3)=2, P(4)=2$ . Determine the resource constraints. Draw the scheduled graph with resource constraints.
- 1B. Determine the prime implicants for the following function using iterated consensus method  

$$F = \sum m(0, 2, 3, 4, 5, 6)$$
- 1C. Explain the flow of digital design flow and verification. (5+3+2)
- 2A. Apply ASAP algorithm for the given data flow graph shown in Fig.1. Determine the latency. Draw the scheduled graph. Assume all the operations has unit execution delay
- 2B. Find complement of the following function using shannon's expansion algorithm  

$$F = wx'y + w'xy + yz' + wxy' + wy'z'$$
- 2C. Define the term verification and explain the process of verification (5+3+2)
- 3A. Using tabular method, obtain prime implicants and minimal expression for the following function  

$$F = \sum m(6, 7, 8, 9) + d(10, 11, 12, 13, 14, 15)$$
- 3B. Explain ALAP algorithm with an example. Also define the term latency and mobility.
- 3C. Write the Verilog AMS code for the given expression to calculate  $V=I.R$  The values can be suitably assumed. (5+3+2)
- 4A. Write a Verilog-AMS code for the circuit shown in Fig:2 to calculate the voltage across  $R_L$ . Assume  $R=1\Omega, L=1\mu h, C=1\mu F$ .
- 4B. Draw ROBDD for the function  $F=ab+bc+ca$  in the order of a-c-b. Also perform ITE algorithm for the same.
- 4C. Write the syntax for Parameter declaration and Electrical declaration. (5+3+2)
- 5A. Construct ROBDD for MOD 5 Synchronous counter. Show all the steps.
- 5B. Explain clique partitioning algorithm with an example.
- 5C. Perform ITE algorithm for 2 input XNOR gate. (5+3+2)

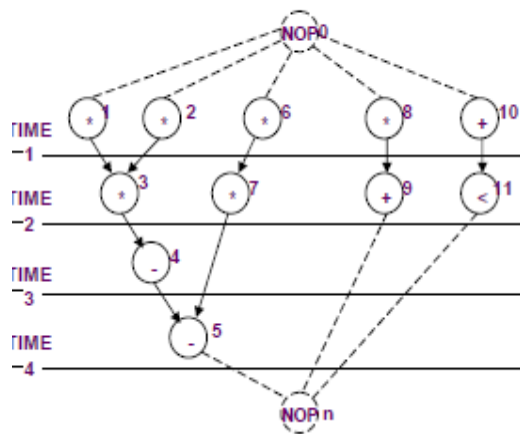


Fig: 1

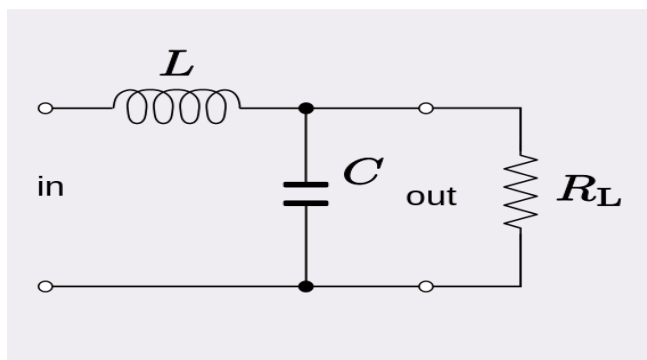


Fig: 2