**College of Engineering, Pune**

**Dept of Computer Engineering & Information Technology**

**Second Year B.Tech Computer Engineering**

**Theory of Computation - Test 2**

03/06/2022Time- 4pm to 5pm Max Marks - 20

Answer all Questions  
Marks for each question is given along with

1. Show by giving an example that if M is an NFA that recognizes a regular language C, swapping the accept and nonaccept states in M doesn’t necessarily yield a new NFA that recognizes the complement of C. (3 marks)  
  
2. Prove that the language {ww | w {0,1}\*} is not regular. (3 marks)  
  
3a. What is the output state(s) of the following NFA after processing the string baa. (2 marks)

3b. Convert the NFA to DFA. (4 marks) Diagram

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4. Use the product construction to create a DFA for L = {w | w has an even number of a’s and each a is followed by at least one b}. Convert the resulting DFA into a regular expression. (4 marks)  
  
5. Find a minimal DFA for the following FA. (4 marks)Diagram

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