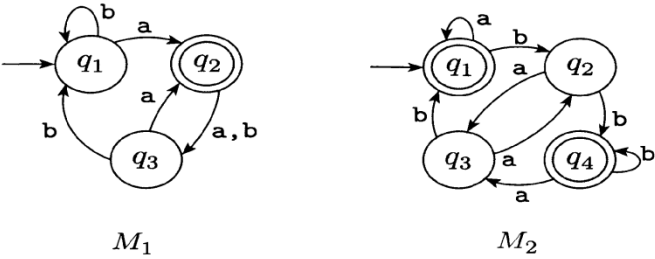


<p><b>Q1. Short Questions</b></p> <p>(a) Formal definition of Regular Expression. Give two examples.</p> <p>(b) Formal definition of Context-Free Grammar (CFG). Give two examples.</p> <p>(c) Consider the language <math>\{0^n1^n \mid n &gt; 0\}</math>. Construct a CFG of this language.</p> <p>(d) Formal definition of NFA. Give one example</p>	<p>5</p> <p>5</p> <p>5</p> <p>5</p> <p>(20)</p>
<p><b>Q2. <math>\Sigma = \{a, b\}</math></b></p> <p>Consider the following Regular Expressions: <math>a.b^* \mid a.b.a</math></p> <p>Write the language (i.e. set of words) generated by this Regular Expression.</p> <p>Construct NFA that accepts this Regular Expression.</p> <p>Also write the complete formal description of the constructed NFA</p>	<p>(10)</p>
<p><b>Q3. Describe the major role of Lexical analysis, Syntax analysis, and Semantic analysis. Give an example.</b></p>	<p>(10)</p>
<p><b>Q4. The following are the state diagrams of two Finite Automates, <math>M_1</math> and <math>M_2</math></b></p> <div data-bbox="492 1298 1143 1555"></div> <p>(a) Give the complete formal description of machines <math>M_1</math> and <math>M_2</math> pictured above</p> <p>(b) Write the Transition Functions of machines <math>M_1</math> and <math>M_2</math>.</p> <p>(c) What sequence of states <math>M_1</math> and <math>M_2</math> go through on input aabbb ?</p> <p>(d) Do <math>M_1</math> and <math>M_2</math> accept the string <math>\epsilon</math> (Epsilon)?</p>	<p>3</p> <p>3</p> <p>3</p> <p>1</p> <p>(10)</p>