Roll No: | | | | | | | | | | | |

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Mid Term Examinations - October 2026

Date: 06/10/2026 **Time:** 11:45 AM - 01:15 PM

Course Code: CSE2266 **Course Name:** Theory of Computation

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	92	88

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	**Define Deterministic Finite Automata.**	2	CO1	BT1
2	**Compute W^3 for alphabet set W={x,1}.**	2	CO1	BT2
3	**Differentiate Klene $^+$ and Klene * operations with an example language L{a,b,0}**	2	CO1	BT2
4	**Defend the importance of finding equivalence classes in the DFA minimization process.**	2	CO2	BT2
5	**What is a regular language? Represent a simple finite machine to accept binary numbers having 101 as substring .**	2	CO2	BT1

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Let L={a,b}^{2} and M={0,1}^{3} . Generate the language X such that string in X={w | w ϵ ML }. What is the string length in the resultant language X.	10	CO1	BT2
7	**Consider the language definition L={a^2b^2} , N={x^2y^2} , where D={W | Wϵ N^RL^R ,where N^R, L^R are reverses of L, N, respectively}. Write the string set available in D. What is the string length of strings in D.**	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	**Explain any five operations on languages with suitable examples.**	10	CO1	BT2
9	**Explain any five operations on strings with suitable examples.**	10	CO1	BT2

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	**Prepare DFA to accept language having prefix 110. Represent your result as quintuple model of machine. Prove acceptance of string with prefix 110 in your resultant machine.**	10	CO2	BT3
11	Prepare a DFA to accept the language having the suffix 101. Represent your result as a quintuple model of a machine. Prove acceptance of a language string with the suffix 101 in your resultant machine.	10	CO2	BT3

<table>
<tr><th colspan="5">PART E: Answer Any 1 Following Questions. 10 M</th></tr>
<tr><th>Q.N.</th><th>Questions</th><th>M</th><th>CO</th><th>BT</th></tr>
<tr><td>12</td><td>11.
<table>
<tr><td>Present state</td><td colspan="2">Next state</td></tr>
<tr><td></td><td>0</td><td>1</td></tr>
<tr><td>->p</td><td>{q,s}</td><td>{p}</td></tr>
<tr><td>q</td><td>{p,r}</td><td>{s,r}</td></tr>
<tr><td>r</td><td>{q}</td><td>{p,r}</td></tr>
<tr><td>*s</td><td>{p,t}</td><td>{s}</td></tr>
<tr><td>t</td><td>{q}</td><td>{p}</td></tr>
</table>
Produce equivalent DFA from the given NFA? Represent your equivalent machine with quintuple representation</td><td>10</td><td>CO2</td><td>BT3</td></tr>
<tr><td>13</td><td>Minimize the given Automata. List equivalance set/s identified from given machine. Represent the resultant machine in any three representation methods you have learned.
<table>
<tr><td rowspan="2">Present state</td><td colspan="2">Next state</td></tr>
<tr><td>A</td><td>B</td></tr>
<tr><td>->P</td><td>Q</td><td>P</td></tr>
<tr><td>Q</td><td>P</td><td>S</td></tr>
<tr><td>*R</td><td>Q</td><td>R</td></tr>
<tr><td>S</td><td>R</td><td>T</td></tr>
<tr><td>T</td><td>Q</td><td>P</td></tr>
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