Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 10-10-2025 **Time:** 11.45am to 01.15pm

School: SOCSE	**Program:** B.Tech	
Course Code : CSE2266	**Course Name:** Theory of Computation	
Semester: V	**Max Marks**: 50	**Weightage**: 25%

CO – Levels	**CO1**	**CO2**
Marks	**23**	**27**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	Define Non Deterministic Finite Automata.	**2 Marks**	**L1**	**CO1**
2	Write L^2 for alphabet set L={a,1}.	**2 Marks**	**L2**	**CO1**
3	List any four applications of Push down automata machines.	**2 Marks**	**L1**	**CO1**
4	Differentiate Klene $^+$ and Klene * operations with an example.	**2 Marks**	**L2**	**CO1**
5	What is a regular expression? Represent odd binary numbers using regular expression.	**2 Marks**	**L1**	**CO2**

Part B

Answer the Questions. **Total Marks 40M**

6.	**a.**	Let $P=\{x,y\}^2$ and $M=\{0,1\}^3$. Generate the language X Such that string in X={w/wϵPM }.	**5 Marks**	**L3**	**CO1**
	b.	Explain any five operations on languages with examples.	**5 Marks**	**L2**	**CO1**
		Or			
7.	**a.**	Consider the language definition $L=\{a^2b^2\}$, $N=\{0^21^2\}$, where	**5 Marks**	**L3**	**CO1**

		D={W/Wϵ NL }. Write the string set available in D.			
	b.	Explain any four operations possible in strings	**5 Marks**	**L2**	**CO1**

8.	**a.**	Differentiate Non deterministic Finite Automata and DFA	**5 Marks**	**L1**	**CO1**
	b.	Design DFA to accept language contains even binary numbers.	**5 Marks**	**L3**	**CO2**
		Or			
9.	**a.**	Differentiate £-NFA and Non deterministic Finite Automata.	**5 Marks**	**L1**	**CO1**
	b.	Design DFA to accept language having Prefix 110.	**5 Marks**	**L3**	**CO2**

10.	**a.**	Design DFA for (a)All strings beginning with '11' and ending with '00' (b) All strings over {a,b} with the substring 'abab'	**10 Marks**	**L3**	**CO2**
		Or			
11.	**a.**	Construct equivalent DFA from the given ENFA?	**10 Marks**	**L3**	**CO2**

Present state	Next state		
	A	b	ϵ
->p	{q,s}	{p}	{q}
q	{p,r}	{s,r}	{s}
*r	{q}	{p,r}	{p}
*s	{p,t}	{s}	{q}
t	{q}	{p}	{q,r}

12.	**a.**	Minimize the given Automata using State equivalence method.	**10 Marks**	**L3**	**CO 2**
		Or			
13.	**a.**	Construct an equivalent DFA from the given NFA	**10 Marks**	**L3**	**CO 2**

Present state	**Next state**	
	a	**b**
P	**R**	**Q**
->Q	**P**	**S**
R	**Q**	**R**
S	**P**	**S**
***T**	**Q**	**P**

Present state	Next state	
	0	1

			P	{q,s}	{p}			
			->q	{p}	{s,r}			
			R	{q}	{p,r}			
			*s	{p,r,t}	{s}			
			T	{q}	{p}			