

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2026

B.Tech-V Semester (CSE/IT)

COURSE CODE (CREDITS):18B11CI513(3)

MAX MARKS: 25

COURSE NAME: FORMAL LANGUAGE & AUTOMATA THEORY

COURSE INSTRUCTOR: Dr. Rakesh Kanji

MAX. TIME: 1 Hour 30 Min

Note:(a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is not allowed

Q.No	Question	CO	Marks
Q1	(i)Apply Pumping lemma for proving given language (L) is non regular. $L = \{a^{2n}b^n \mid n \geq 0\}$. (ii)Explain with the example that Pumping lemma is not applicable to prove regularity.	2	3+2
Q2	(i)Construct the Push down automata for $L = \{wcw^r \mid w \text{ belong to subset of } \{a, b\}^*\}$. w^r is reverse of w. (ii)Identify the obstruction to use Finite state automata to implement this language.	6	4+1
Q3	(i)Apply Pumping lemma to prove given language (L) is non context free language. $L = \{ww \mid w \text{ belong to subset of } \{a, b\}^*\}$. (ii)Identify the obstacle in terms of transition to build algorithm for conversion of NPDA to DPDA.	4,6	3+2
Q4	(i)Write down the conditions to apply Chomsky normal form for any given context free grammar. (ii)Apply Greibach normal form. • $S \rightarrow AB \mid b$ • $A \rightarrow Sa \mid a$ • $B \rightarrow b$	5	1+4
Q5	(i>Show that below grammar is ambiguous. • $E \rightarrow E + E$ • $E \rightarrow E * E$ • $E \rightarrow id$ (ii)Verify whether the regular can be ambiguous or not with the example.	3,2	3+2