विश्वजीवनामृतं ज्ञानम्

ABV- Indian Institute of Information Technology & Management, Gwalior

Theory of Computation (IT206)

Minor Examination (Session 2023–24)

Maximum Time: 1.5 Hours **Max Marks: 25**

Note: Attempt all questions. Marks are indicated against each question.

1. Define the following with examples: (i) Deterministic Finite Automata (DFA) (ii) Non-deterministic Finite Automata (NFA) (iii) Regular Language (5 Marks)

2. Construct a DFA that accepts all binary strings ending with "01". Show state transition diagram. (5 Marks)

3. Prove that the language $L = \{a^n b^n \mid n \geq 0\}$ is not regular using Pumping Lemma. (5 Marks)

4. (a) Explain the equivalence of NFA and DFA with an example. (b) Minimize the following DFA (states: $\{A, B, C, D\}$, input: $\{0, 1\}$, final states: $\{C, D\}$). (5 Marks)

5. Write short notes on (any one): (i) Pushdown Automata and its applications (ii) Unsolvable Problems in Computation (5 Marks)