

Enrollment No.

**KADI SARVA VISHWAVIDYALAYA**

**VIDUSH SOMANY INSTITUTE OF TECHNOLOGY AND RESEARCH, KADI**  
**B.E. Semester- 3 (CE/CSE/IT) MID-SEMESTER EXAMINATION October-2022**

**Subject: Engineering Mathematics-3 (CC301-N)**

**Date:10/10/2022**

**Day: Monday**

**Time: 11:00am to 12:30pm**

**Marks: 30**

**Instructions:**

- 1) All questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Indicate clearly, the options you attempt along with its respective question number.

<b>Q-1 (A)</b>	A relation is define on set Z is $R = \{(x, y) / x - y \text{ divided by } 7\}$ then check that R is equivalence relation or not.	<b>[5]</b>
<b>Q-1 (B)</b>	Show that cube roots of unity form an Abelian group under multiplication.	<b>[5]</b>
<b>Q-2 (A)</b>	Let $f: \mathbb{Z} \rightarrow \mathbb{Z}$ be define by $f(x) = x^2 + 1$ . Then check that f is Bijective or not.	<b>[5]</b>
<b>Q-2 (B)</b>	Define Join-irreducible elements, Meet-irreducible elements, Atom and Anti-atom. Find the Join-irreducible elements, Meet-irreducible elements, Atom and Anti-atoms for the lattice $\langle S_{70}, D \rangle$ .	<b>[5]</b>
OR		
<b>Q-2 (A)</b>	Prove that $\{P(A), \leq\}$ is lattice for $A = \{a, b, c\}$ .	<b>[5]</b>
<b>Q-2 (B)</b>	Prove that $\langle \{1, 3, 3^2, 3^3, \dots\}, D \rangle$ are Poset and chain.	<b>[5]</b>
<b>Q-3 (A)</b>	Let p, q and r be the statement then construct the truth table for the statement formula A, $A: (\sim p \wedge q) \rightarrow r$ .	<b>[5]</b>
<b>Q-3 (B)</b>	Prove that the set $G = \{0, 1, 2, 3, 4\}$ is an abelian group under addition modulo 5.	<b>[5]</b>
OR		
<b>Q-3 (A)</b>	Define the following term with example and truth table. 1.Negation 2. Conjunction 3. Disjunction 4. Contradiction	<b>[5]</b>
<b>Q-3 (B)</b>	Expressed the Boolean expression $(x_1 \oplus x_2)' * x_3$ in an equivalent products of sum canonical form.	<b>[5]</b>

