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 Time: 11:00am to 12:30pm

Day: Monday 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.

Q-1 (A) 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. Q-1 (B) Show that cube roots of unity from an Abelian group under multiplication. Q-2 (A) Let f: Z \rightarrow Z be define by $f(x) = x^2 + 1$. Then check that f is Bijective or not. Q-2 (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 $\langle s_{70}, D \rangle$. OR Q-2 (A) Prove that $\{P(A), \leq \}$ is lattice for A = $\{a, b, c\}$. Q-2 (B) Prove that $\langle \{1,3,3^2,3^3,\cdots\},D \rangle$ are Poset and chain. [5] Q-3 (A) Let p, q and r be the statement then construct the truth table for the statement formula A, A: $(\sim p \land q) \rightarrow r$. Q-3 (B) Prove that the set G = $\{0,1,2,3,4\}$ is an abelian group under addition modulo 5. OR Q-3 (A) Define the following term with example and truth table. 1.Negation 2. Conjunction 3. Disjunction 4. Contradiction Q-3 (B) Expressed the Boolean expression $(x_1 \oplus x_2)' * x_3$ in an equivalent products of sum canonical form.							
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