

**VIT**Vellore Institute of Technology
Established in the year 1984 and started its academic activities in 1986

REG.NO.:

6538

**SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
WINTER SEMESTER 2025-2026**

SLOT: A1+TA1+TAA1

Programme Name & Branch : Integrated M.Tech.
Course Code and Course Name : IAMAT202 Discrete Mathematics and Graph Theory
Faculty Name : Dr. Priya Das
Class Number(s) : Common slot
Date of Examination : 27/01/2026
Exam Duration : 90 minutes

Maximum Marks: 50**General instruction(s):**

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes CO1: apply proof techniques in solving logical problems CO2: relate algebraic structures to enhance problem-solving techniques.

Q. No	Question	M	CO	BL
1.	Obtain the Principal conjunctive normal forms and Principal disjunctive normal forms of the following statement $(p \rightarrow (q \wedge r)) \wedge (\neg p \rightarrow (\neg q \wedge \neg r)).$	10	CO1	BL1
2.	Prove that the following premises are inconsistent. $a \rightarrow (b \rightarrow c), d \rightarrow (b \wedge \neg c)$ and $a \wedge d.$	10	CO1	BL2
3.	a) Verify the validity of the argument "All birds have wings. Sparrow is a bird. Therefore, Sparrow has wings".	5	CO1	BL2
	b) Prove by an indirect method of proof, that $(\forall x)(p(x) \vee q(x)) \Rightarrow (\forall x) p(x) \vee (\exists x) q(x).$	5		
4.	Let D_{30} be the set of all positive divisors of 30. Draw the Hasse diagram of $(D_{30}, \leq)$, where " $a \leq b$ " means " a divides b ". Is it a lattice? Justify your answer. Find GLB of $\{3, 10\}$ and LUB of $\{3, 10\}$.	10	CO2	BL3
5.	Let $(L, \leq)$ be a lattice. For any $a, b, c \in L$, prove the following statement $b \leq c \Rightarrow \begin{cases} a * b \leq a * c \\ a \oplus b \leq a \oplus c \end{cases}$	10	CO2	BL3
