



VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

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

REG.NO.:

SLOT: A2+TA2+TAA2

Programme Name & Branch : B.Tech.
Course Code and Course Name : IAMAT202 - Discrete Mathematics and Graph Theory
Faculty Name(s) : Dr. A. Chandrasekar, Dr. Arun Choudhary, Dr. R. Palanivel
Class Number(s) : Common to A2 slot
Date of Examination : 15/03/2026
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 (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)
CO-2 Relate algebraic structures to enhance problem-solving techniques
CO-3 Solve engineering problems involving counting principles.
CO-4 Understand the fundamentals of graph theory, including trees and connectivity.

Q. No	Question	M	CO	BL
1.	Find the canonical CNF and canonical DNF of the Boolean function $f(x, y, z) = (x + y)(y + z)(x' + z')$.	10	2	2
2.	In a university of 300 students, 180 students like Mathematics, 150 students like Physics, 130 students like Chemistry, 90 students like both Mathematics and Physics, 70 students like both Physics and Chemistry, 60 students like both Mathematics and Chemistry, 40 students like all three subjects. Then find (a) How many students like at least one subject? 280 (b) How many students like none of the subjects? 20 (c) How many students like exactly one subject? 140 (d) How many students like exactly two subjects? 100	10	3	3
3.	Use the method of generating function to solve the recurrence relation $a_n = 2a_{n-1} - 5, n \geq 1$ with initial condition $a_0 = 3$.	10	3	3
4.	a) At a recent math seminar, 9 mathematicians greeted each other by shaking hands. Is it possible that each mathematician shook hands with exactly 7 people at the seminar?	5	4	2
	b) Determine if the following two graphs are isomorphic: Graph $G_1: V = \{1, 2, 3, 4\}, E = \{(1,2), (2,3), (3,4), (4,1)\}$. Graph $G_2: V = \{a, b, c, d\}, E = \{(a,c), (c,b), (b,d), (d,a)\}$. Show your reasoning based on vertex degrees and adjacency.	5		2
5.	a) Consider a graph G representing a map of five cities where every city is connected to every other city (Complete Graph K_5). I. Does this graph contain an Euler Circuit? Justify. II. Determine if the graph is Hamiltonian and find one Hamiltonian Cycle.	6	4	3
	b) In a graph with 6 vertices, what is the maximum number of edges the graph can have if it is disconnected ? $0, 6$	4		2
