



SCHOOL OF ADVANCED SCIENCES  
CONTINUOUS ASSESSMENT TEST - I  
FALL SEMESTER 2025-26

Programme Name & Branch : B.Tech  
 Course Code : RMAT205L  
 Course Name : Discrete Mathematics and Graph theory  
 Faculty Name(s) : ANJANEYULU G S G N, PALLAVI MISHRA, ABHISHEK DAS  
 PRAVEEN, SELVAKUMAR R, PARTHIBAN A, SUJASREE M  
 Class Number(s) : 2452,4418,0889,0869,0864,0893,0872  
 Date of Examination : 17.08.2025 (Session 1)  
 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)

CO1. Learn proof techniques and concepts of inference theory  
 CO2. Use algebraic structures in applications

Q. No	Question	M	CO	BL
1.	Obtain the PDNF and PCNF of the following formula and hence conclude whether it is a tautology $(P \rightarrow (Q \wedge R)) \wedge (\neg P \rightarrow (\neg Q \wedge \neg R))$	10	1	BL3
2.	Test the consistency of the following Statements. i. If Jack studies well he will pass in exams. ii. If Jack studies well he will get a job. iii. Succeeding in exam and getting a job simultaneously are not possible for him. iv. Jack either enjoys or studies well. v. Finally, Jack enjoys.	10	1	BL3
3.	Show that the conclusion $(x)(F(x) \rightarrow \neg S(x))$ follows from (i) $(\exists x)(F(x) \wedge S(x)) \rightarrow (y)(M(y) \rightarrow W(y))$ and (ii) $(\exists y)(M(y) \wedge \neg W(y))$	10	1	BL3
4.	a) Prove that the set of all idempotent elements of a commutative monoid $(M, *)$ forms a submonoid b) Show that if every element in a group is its own inverse, then the group must be abelian.	5+5	2	BL2
5.	Prove that the order of a subgroup of a finite group divides the order of the group. <i>(10)</i>	10	2	BL2