DISCRETE MATHEMATICS

CIE 1 QUESTION BANK

S.NO	**SHORT QUESTIONS**
	UNIT-1
1	Find the Contrapositive and the Converse of the conditional statement **"If it is raining, then the home team wins."**
2	Prove $(P \rightarrow Q) \Leftrightarrow (\neg P \vee Q)$
3	Define Contingency and Contradiction. Give one example for each
	UNIT -2
4	If A={α,β}, B={1,2,3}. Find out (AxB) U(BxA)
5	Define binary relation . List the properties of binary relation.
6	f(x)= 2x + 3 and g(x)= 3x + 2. Find (fog)(x)
	UNIT -3
7	Define Sum Rule.
8	State Product Rule
9	How many 3 letter words can be formed using the letters a, b, c, d, e and f by using a letter only once.

S.NO	**LONG QUESTIONS**
	UNIT -1
1	a) Define Tautology b) Show that the formula $Q \vee (P \wedge \neg Q) \vee (\neg P \wedge \neg Q)$ is a tautology
2	a) State Rules of Inference. Show that R→S, can be derived from the premises P→ (Q→S), ¬R ∨ P and Q b) Define Conjunctive Normal Form.
3	a) Define Disjunctive Normal Form. b) Obtain the principal disjunctive normal form of P V (~P → (Q V (~Q → R)))
	UNIT -2
4	a) Define an Inverse Function. Give example b) If R is set of real numbers, then show that the function: f: R →R : defined by $f(x)= x^5 - 1$ is one to one function.
5	Let A={1,2,3}, B={a,b,c} and C={x,y,z}.The relation R from A to B is {(1,b),(2,a),(2,c)} and the relation S from B to C is{(a,y),(b,x),(c,z)}. Find the composition relation, RoS. SoR, RoR, SoS
6	a) Determine whether the function f from {a,b,c,d} to {1,2,3,4,5} with f(a)=4, f(b)=5,f(c)=1, and f(d)=3 is one-one.

	b)Compute the transitive closure of the relation R={(1,1),(1,2),(1,3),(2,3),(3,1)} defined over a set S={1,2,3}
	UNIT -3
7	a)How many integers between 1 to 250 are divisible by 2 or 3 or 5 or 7? b) In how many ways can 30 distinguishable books be distributed among 3 people A, B and C such that A and B together receive exactly twice as many books as C.
8	a)A man has 15 close friends of whom 6 are women, in how many ways can he invite 3 or more of his friends to a party. b) Find the number of arrangements of the letters MISSISSIPPI
9	a)In how many ways can 10 people be seated in a row so that a certain pair of them are not next to each other. b) How many ways are there to pick a man and a woman who are not married from 30 married couples.