# **Question Paper Code: 54021**

### B.E./B.Tech. DEGREE EXAMINATION, DEC 2020

#### Fourth Semester

Computer Science and Engineering

#### 15UMA421 - DISCRETE MATHEMATICS

(Common to Information Technology)

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A -  $(6 \times 1 = 6 \text{ Marks})$ 

## (Answer any six of the following questions)

1.	The symbolic form of "	CO1- R					
	(a) $P \rightarrow Q$	(b) $\neg Q \rightarrow \neg P$	(c) $\neg P \rightarrow Q$	(d) $P \rightarrow (P \lor Q)$			
2.	Given $P = \{2,3,4,5,6\}, (\exists x \in P) (x+3=10)$	state the truth va	alue of the stateme	ent CO1- R			
	(a) True						
	(c) Neither true nor false	2	(d) None of the above				
3.	What is the number of arrangement of all the six letters in the wordCO2- RPEPPER?						
	(a) 50	(b) 6	(c) 60	(d) 600			
4.	What is the solution of the recurrence relation $a_n = a_{n-1} + 2a_{n-2}$ ? CO2- R						
	(a) $C_1(-1)^n + C_2(-2)^n$	(b) $C_1(2)^n + C_2(-2)^n$	(c) $C_1(-2)^n + C_2$	(d) $C_1(2)^n + C_2(-1)^n$			
5.	If the degree of any vertex of a graph is one, then the vertex is called CC						
	(a) Pendent	(b) Pseudo	(c) Multiple	(d) Cyclic			
6.	A graph is called if there is a path between every pair of CO3- distinct vertices of the graph.						
	(a) Disconnected	(b) Connected	(c) Euler	(d) Hamiltonian			

7.	Let S be a non empty set and $*$ be a binary operation on S. The algebraic system (S, $*$ ) is called aif the operation $*$ is associative.										
	(a) Group	(b) Semigroup	(c) Monoid	(d) Abelian							
8.	A subgroup (H,*) of aH=Ha	(G,*) is called a	if for any $a \in G$ ,		CO4- R						
	(a) Group (b	(c) Abelian group	(d) Cyclic group								
9.	The complemented, d		CO5- R								
	(a) Boolean algebra	(b) Distributive	(c) Lattice	(d) Sub latti	ce						
10.	$a \bullet b + a \bullet b' =$			CO5- R							
	(a) a	(b) b	(c) <i>a</i> ′	(d) <i>b</i> ′							
	$PART - B (3 \times 8 = 24 \text{ Marks})$										
(Answer any three of the following questions)											
11.	Obtain the PCNF and PDNF of $(P \land Q) \lor (\neg P \land R)$			CO1- An	a (8)						
12.	Find the number of the integer	ole CO2- Ap	p (8)								
13.	by any of the integers 2, 3, 5 & 7. Prove that in a simple graph with n vertices and k components cannot CO3- A have more than $\frac{(n-k)(n-k+1)}{2}$ edges.										
14.		is an abelian group	where * is defined	by CO4-An	a (8)						

$$a*b = \frac{ab}{2}, \forall a, b \in Q^+$$

- 15. Let  $D_{30} = \{1, 2, 3, 5, 6, 10, 15, 30\}$  and let the relation R be divisor on  $D_{30}$ . CO5- App (8) Find (a) all the lower bounds of 10 and 15.
  - (b) the glb of 10 and 15.
  - (c) all upper bounds of 10 and 15.
  - (d) the lub of 10 and 15.
  - (e) draw the Hasse diagram.