BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE PILANI K K BIRLA GOA CAMPUS

FIRST SEMESTER 2019-20	020, Mid-Term Examination (C	closed Book)
e no.: MATH F213	Day: Saturday	Date: September 28, 2019
se title: Discrete Mathematics	Time: 90 minutes	Max Marks: 60
RUCTIONS: 1. All questions are c plain all steps clearly to get full cred	compulsory. 2. Begin answering a n it. 4. Incomplete/No index costs 2	ew question on a fresh page. marks.
Translate the following into symbolic table .	e form and test the validity of the an	gument without using truth
If 6 is even then 2 does not divide 7. 6 is odd.	Either 5 in not prime or 2 divides	7. But 5 is prime, therefore, [5]
Prove by principle of mathematical i	nduction that for all integers $n \ge 4$	$4, 3^n > n^3.$ [7]
Let $A = \{1, 2, \dots, 15\}$ and the equiv Find the equivalence class of $(3, 2)$.	valence relation R on $A \times A$ define	d by $(a,b)R(c,d)$ if $ad = bc.$ [5]
Let $A = \{1, 2, 3, 4\}$ and let R be the transitive closure of R using Warsha	relation on A , where $R = \{(1, 2), ($ ll's algorithm.	(2,3), (3,4), (2,1). Find the [8]
Prove that for a bounded distributiv	e lattice L , the complements are un	nique if they exist. [5]
Consider the lattice $D_{60} = \{1, 2, 3, 4,\}$	$5, 6, 10, 12, 15, 20, 30, 60\}$	
(a) Find all join irreducible element	ts.	[3]
(b) Draw the Hasse diagram.		[4]
(c) Find all atoms.		[2]
(d) Find complements of 10, if exist	t.	[1]
(a) Write the circuit diagram (or ga	ate diagram) of $f(x_1, x_2, x_3) = (x_1 \cdot x_2)$	$(x_2 + x_3) \cdot ((x_2 + x_3) + x_3).$ [4]
(b) Simplify the function in part- $(a$) by using basic Boolean algebra la	aws. [3]
(c) Write the circuit (gate) diagram	n of the result obtained in part- (b) .	[3]
(a) Use a K-map to find a minimal	sum-of-products form for $E = xy'$	+xyz + x'y'z' + x'yzt'. [5]
(b) Find all prime implicants of E	= xy + y't + x'yz' + xy'zt' using co	onsensus method. [5]
	FIRST SEMESTER 2019-20 is no.: MATH F213 se title: Discrete Mathematics FRUCTIONS:1 . All questions are complain all steps clearly to get full cred Translate the following into symbolic table . If 6 is even then 2 does not divide 7. 6 is odd. Prove by principle of mathematical in Let $A = \{1, 2, \dots, 15\}$ and the equiv- Find the equivalence class of $(3, 2)$. Let $A = \{1, 2, 3, 4\}$ and let R be the transitive closure of R using Warsha Prove that for a bounded distributive Consider the lattice $D_{60} = \{1, 2, 3, 4\}$ (a) Find all join irreducible element (b) Draw the Hasse diagram. (c) Find all atoms. (d) Find complements of 10, if exists (a) Write the circuit diagram (or gas (b) Simplify the function in part-(a (c) Write the circuit (gate) diagram (a) Use a K-map to find a minimal (b) Find all prime implicants of E and (c) Find for E and E	FIRST SEMESTER 2019-2020, Mid-Term Examination (C is no.: MATH F213 Day: Saturday se title: Discrete Mathematics Time: 90 minutes CRUCTIONS: All questions are compulsory. 2. Begin answering a n plain all steps clearly to get full credit. 4. Incomplete/No index costs 2 Translate the following into symbolic form and test the validity of the an table. If 6 is even then 2 does not divide 7. Either 5 in not prime or 2 divides 6 is odd. Prove by principle of mathematical induction that for all integers $n \ge 4$ Let $A = \{1, 2, \dots, 15\}$ and the equivalence relation R on $A \times A$ define Find the equivalence class of $(3, 2)$. Let $A = \{1, 2, 3, 4\}$ and let R be the relation on A , where $R = \{(1, 2), (1, 2),$