

PARSHVANATH CHARITABLE TRUST'S

A.P. SHAH INSTITUTE OF TECHNOLOGY

Department of Computer Science and Engineering
Data Science

Semester: JII Subject: DSGT Academic Year: 2000 - 20 2 3 * Equivalence Relations -A relation R on a set A is called an equivalence relation if it is reflexive, symmetric and transitive. The digraph of an equivalence relation will have the following characteristics as Every vertex will have a loop. If there is an arc from a to b there should be an arc from b to a c) If there is an arc from a to b and are from b to c, there should be an arc from a to c. Let A = {a,b,c} and let, MR = Determine whether R is an equivalence relation.



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> R = { (a, a) (b, b) (b, c) (c, b) (c, c) }
Ris reflexive as
(a,a)(b,b) (c,c) e.R.
R is symmetric as
$\frac{(b,c)\in R}{} \to (c,b)\in R$
TO TOURS TIVE at
(b,b) & (b,c) ER implies (b,c) ER
- (C, b) EK implied (h, b) EK
(C,C) & (C,b) ER ignolies (C,b) ER
- COD TOOD EX IMPLES (C,D) EX
- (h) & (h) C) ER IDDIES
Eb, c) e (c, c) ER implies (b, c) ER
Hence R is an equivalence relation.
- 13 ar equivalence oc
2) Let A = &a,b,c,d}
R={(a,a)(b,a)(b,b)(c,c)(d,d)(d,c)}
Determine whether R is an equivalence relation R is reflexive as (â,a)(b,b)(C,c)(d,d) ER
7 R is reflexive as (a,a)(b,b)(C,C)(a,a) Ex
1s not symmetric as
Ristransitive since
(b,a), (a,a) ER > (b,a) ER
$(b,b)(b,a) \in R \Rightarrow (b,a) \in R$
$\frac{(b,b),(b,a) \in R}{(d,c),(c,c) \in R} \Rightarrow \frac{(b,a) \in R}{(d,c) \in R}$
(d,d)(d,c) ER > (d,c) ER
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. R is not an equivalence relation.



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SW.	Semester: .TII Subject: D.S. CyT Academic Year: 2020-2023
(B) A= £1,2,33
	R1 = 2 (1,1) (2,2) (3,3) }
	Ro = 3(1,1)(2,2)(3,3)(2,1)(1,2)
	R3 = { (1,1) (2,2) (3,3) (3,2)(1,3)}
	Ru = { 3
	equivalence relation or not.
	Equivalence relation on the L
7	Given A = {1,2,3}
	Given n = 5 (1 1) (2 2) (3.3) 3
	$R_1 = \{(1,1)(2,2)(3,3)\}$ R ₁ is reflexive as
	KI 12 TEXTEXT VE CL3
	$\begin{array}{ccc} (1,1) & \in \mathcal{R} \\ (2,2) & \in \mathcal{R} \end{array}$
	(3,3) ER
	RI is symmetric as
	(x,y) (y,∞) ∈ R
	the have
	(1,1) (1,1) ER
	(2,2) (2,2) ER (3,3) (3,3) ER.
	(3,3) (3,3) 67.
	RI is symmetric
	Re is y-togositive as
	not
	80 R is not equivalence reletion.

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Semester: 111 Subject: DSGT	Academic Year: 20 22 20 2
iit R2 = {(1,1)(2,2)(3,3)(2,	1761272
R2 is reflexive.	1)(1/2)9
C1,1),(2,2),(3,3) E.R.	
Ro is were made	1 2 20 1251254
R2 is symmetric	
(2'11) ER and (1,2) ER
R3 is transitive	- 9
(2,1) ER	
(1,2) € R	
(2,2) ER.	alatim
so relation R2 is equivo	dence relations
iii/ R3 = {(1,1)(2,2)(3,3)(3,2)	
Pa : (1/1)(2/2)(3/3)(3/2)	
R3 is reflexive.	Sitts Late
(2,2) ER	. 13
(3,3) ER	DR = A
R3 is not symmetric	4 = 0
(2.2) FR hur	1000
(2,3) & R	30 8661
lean so wat lummeral	4 1 0
Hence R3 is not equivalen	ee relation.
iv) Ry = { }	
Rh is not reflexive.	
hence P4 is not equivalent	nce relation.

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