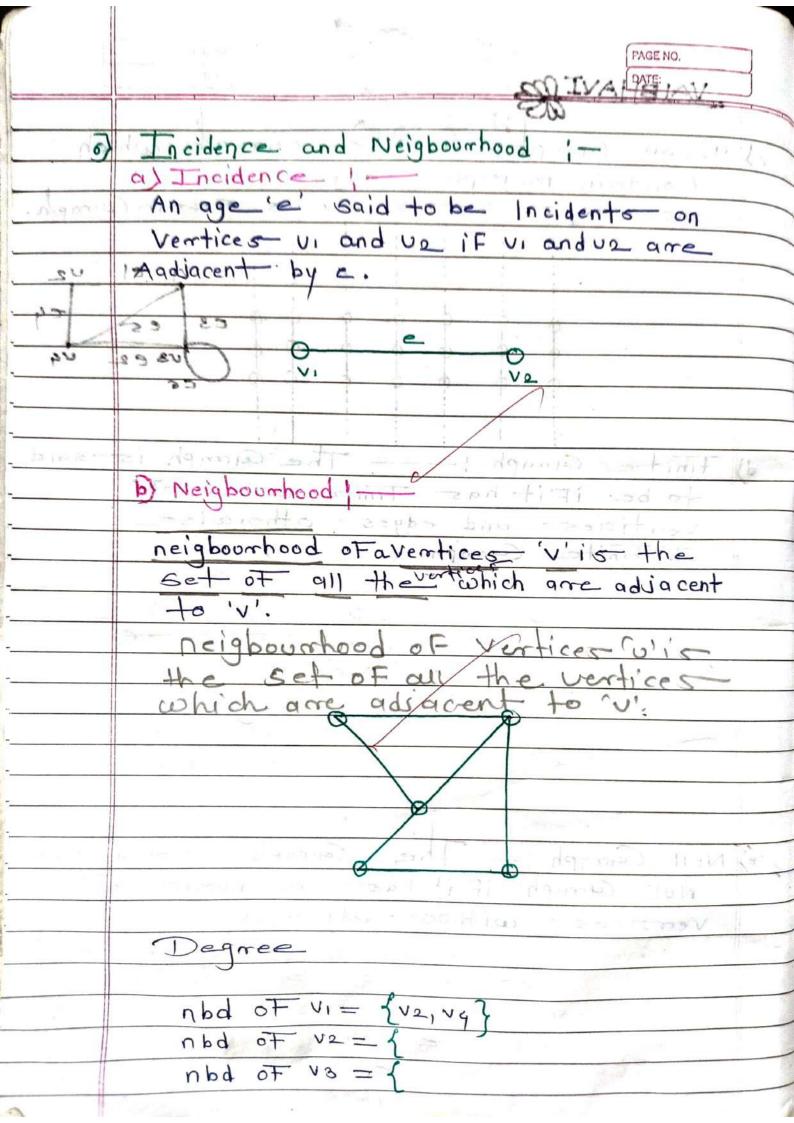
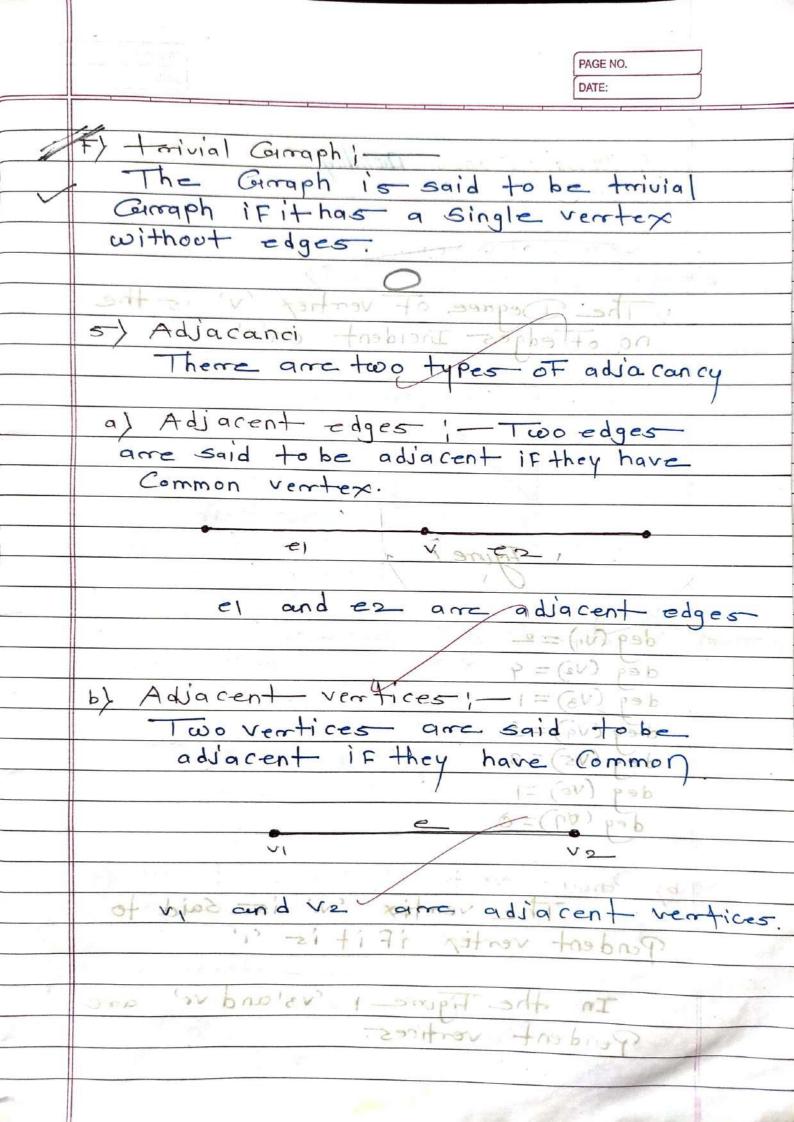
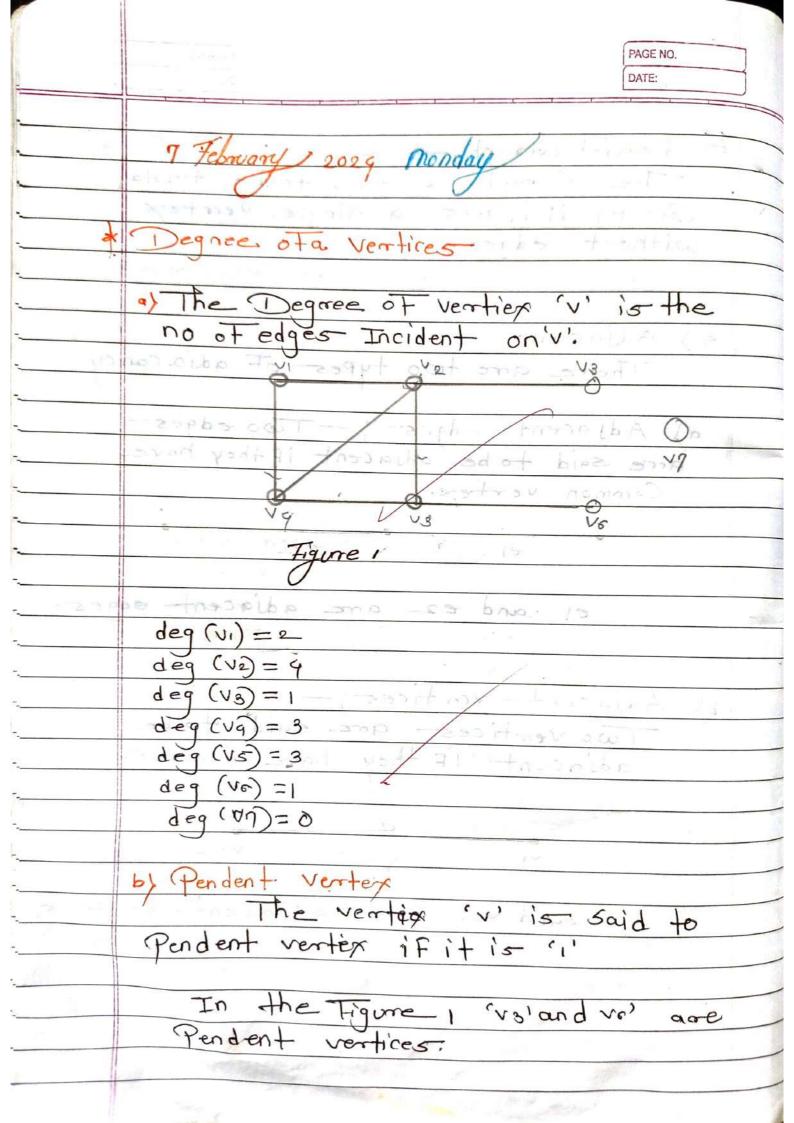


PAGE NO. DATE: of Psedo Graphi - The Graph which Contain multiple edges as well as loops is known as pseudo Graph. and us if we endus dress money el Jus e 2 Finite Garaph . The Garaph is said d to be if it has Finite number of verticies and edges otherwise Inthinities Comaphinisto booknoodpion of all the turned and adjacent 0 - 0 ALOUGH THE NUIL Camaph 1 The Camaph is said to be NULL Graph if it has any number of vertices without edge. 91,00 0 To bd0 O sv to ban

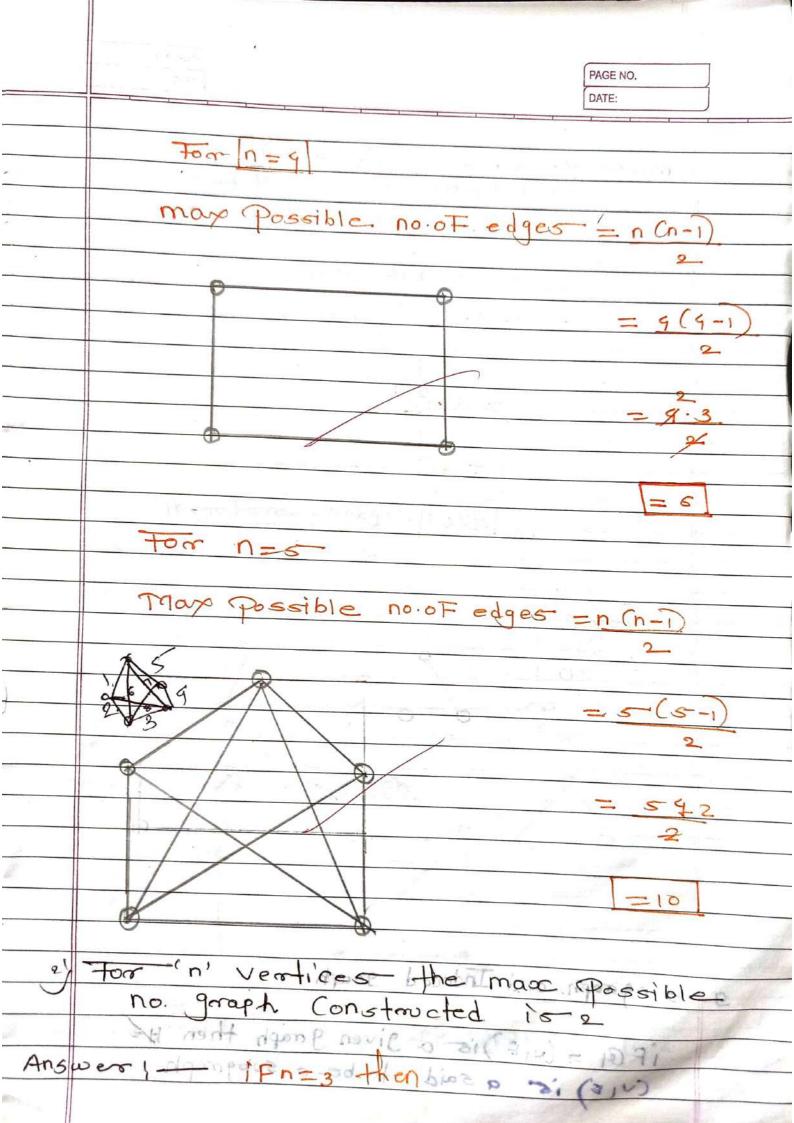


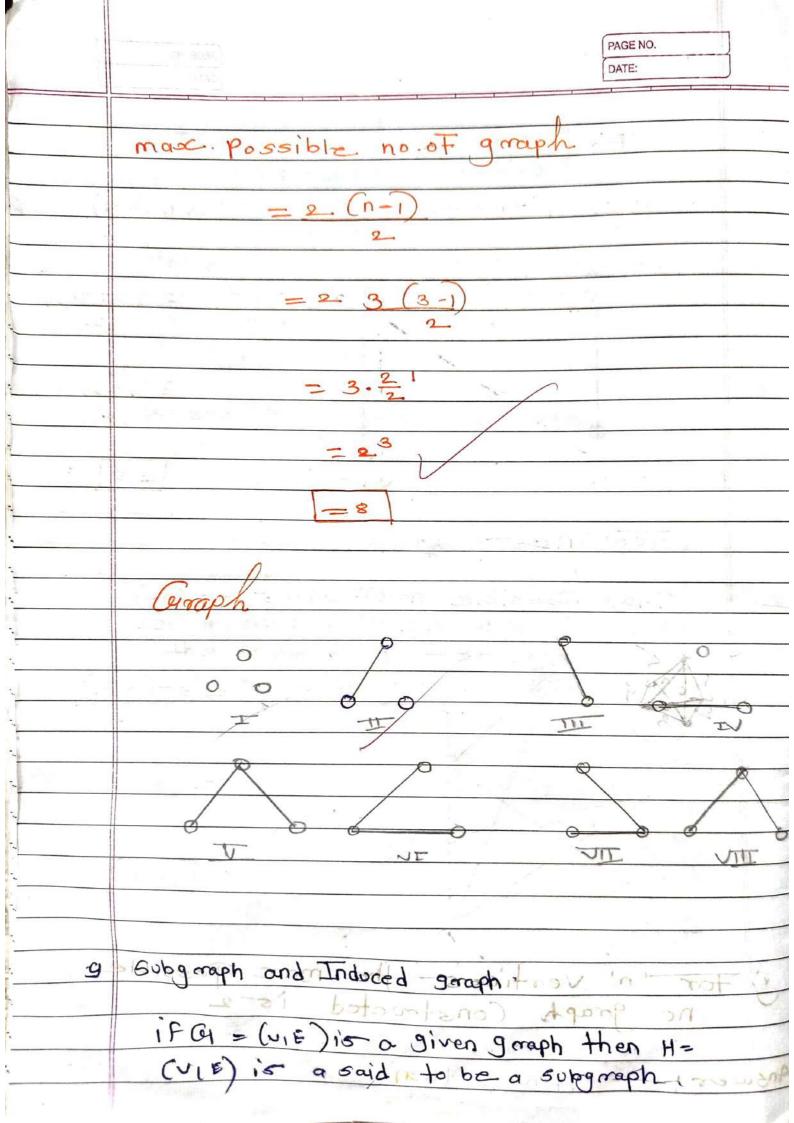


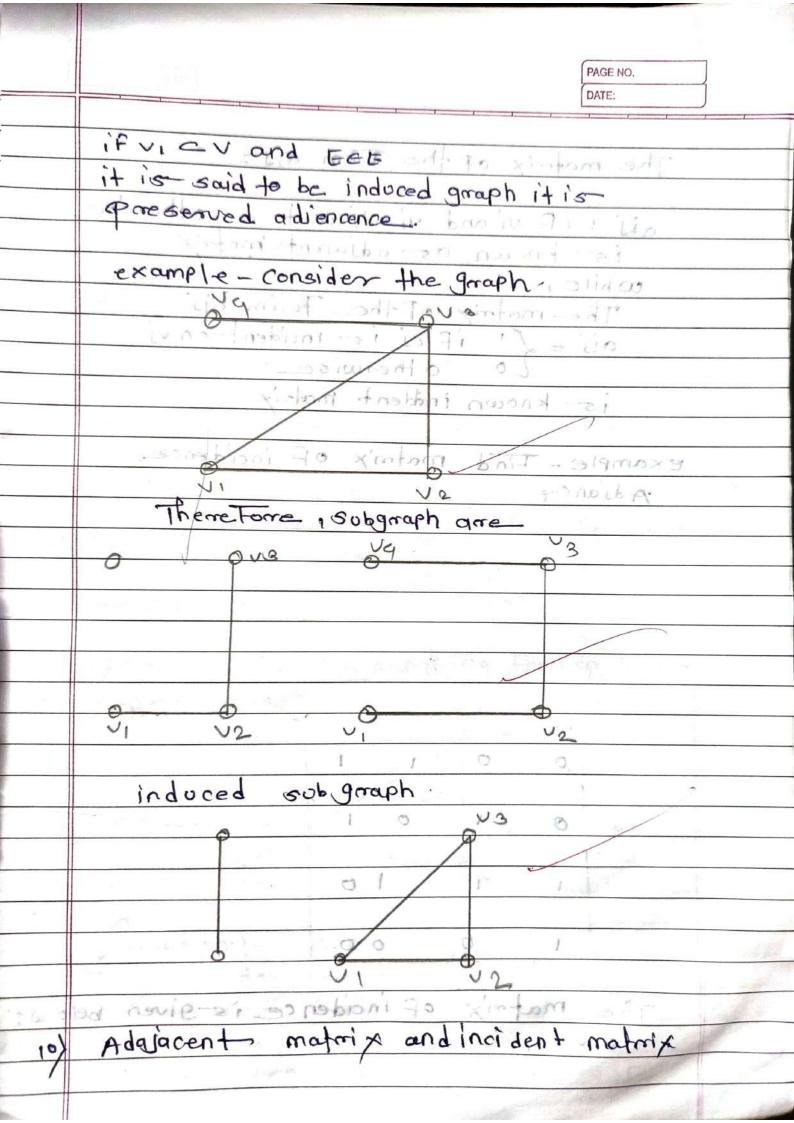


PAGE NO. DATE: chisolated vertex vivis said to the Isolated vertex ifitis Degree is 'o' In the figure-1 (v) is an Isolated ventex. - succept of happen - shift no a work and phosphoma of pm ms=(4) mb) = egree sequences of a Gyraph. cels (m' is-number a) The degree Sequence of a Graph is the Collection of degree of all the vertices of the arrange in either Ingreasing order or Decreasing Order. The sequence of a Grouph in Figure-1 the minimum pesison avilgessis 0,1,1/2,8,3,4 913131211110 Answer - .. tand- shaking Theorem / Fundamenter b Reorem of Graph theory statement; ___ it's states that the Sum of degrees of all the verticesof a grouph is twice of number

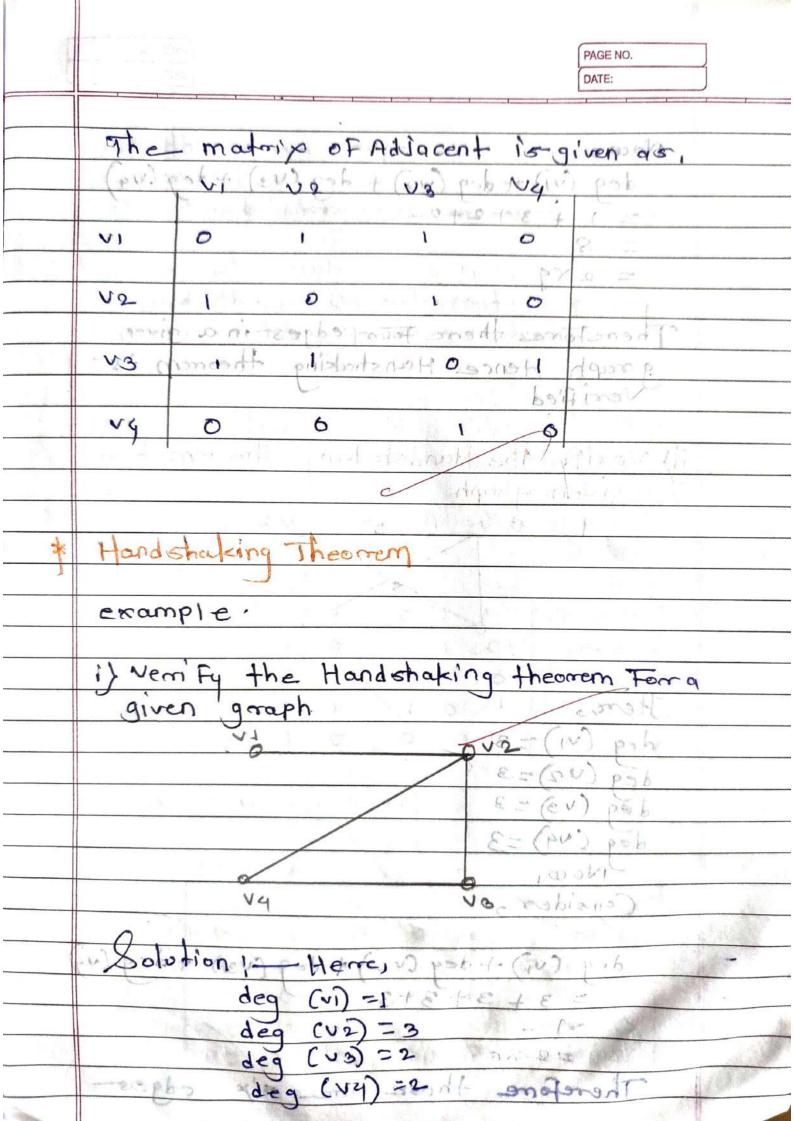
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-	0+1+1+2+3+3+4-14=287.
	where '7' is the number of edges-
b	Hence Handshaking theorem is verified
	For this graph in Figure -1
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intial and terminal ventices are different is known as an open walk while, a walk in which intial and terminal ventices— are some is known as an open walk terminal ventices— are some is known as close walk

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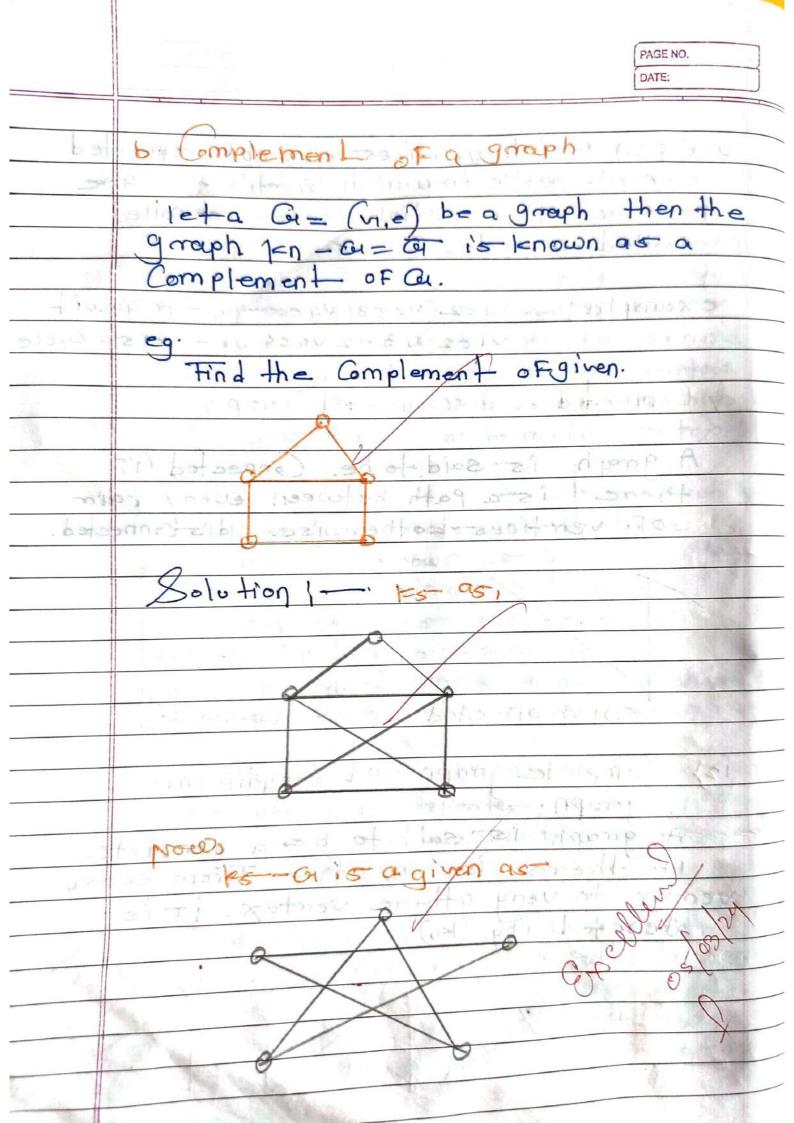
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ego vienes vi es vgo ist notia path el vice 2 va voes is a path

in which edges are not repeated

is known as are are while, a closed

PAGE NO. DATE: walk in which vertices are not repeated except wealk to which vertices are not re the intial vertex is called Colled a cycle example 1- Vier uses vier vi -+ amovit VIC2 VBervacy VI - 415a cycle Had the Complement of given. er Connected & disconnected grouph A graph is said to be Connected lif there is a path between every pain of vertices otherwise idisconnected. Connected Disconnected Complete graph and Compliment A grouph is said to be a complete F there is an edger From every ventex to very othere ventex. it is denoted by (kn)

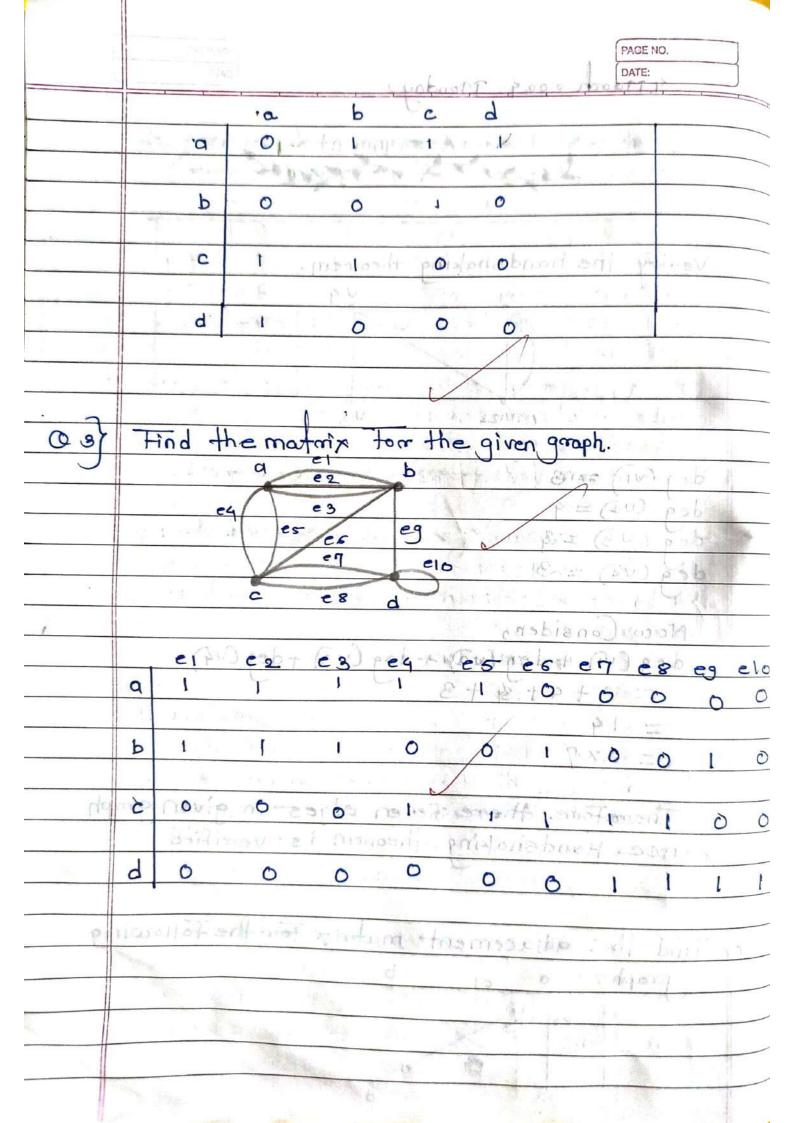


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PAGE NO. DATE: table of the Construct the trouth Png Compound proportion D4=9 PV 79 F F T F F 4 T mole - when be han eno 8 9 00 Hon 10.1.1.1S the but P -1 7 7 7 siderf 1000 dtrond L- VE 91-1x (p49) 1249



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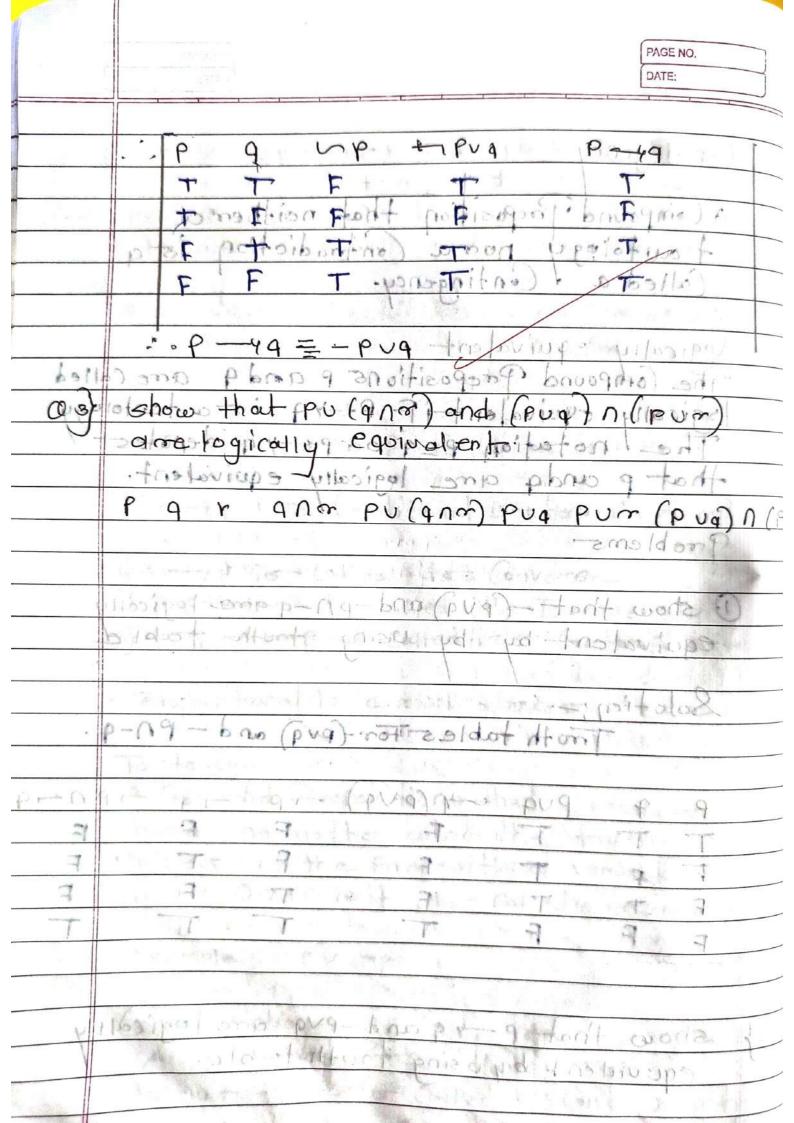
Explain the terms walk open and closed walk, trial path, Growit and Gde with appropriate example. a) wate :- A Finite and alternating Sequence of ventices of edges stanting From a ventex and ends at a ventex known as walk. A stanting ventex is known as intial vertex and end vertex is known as a + cominal mentexities part 10 (seems vine) . e-9 Viel juzez jusie a walk in which us mes initial 8 was ist terminal vertex? 71 by open and closed walk in which intial and iterminal ventex is known as open walk, while a work in which in which intial and terminal vertex is some is known as closed walk. sipol wood is gong. eg, viel uzez uses u4 is a ofen walk Ules, uses viis a dosed walk A Compound Parepasitions that is always of Trial and Patholin A walk is open walk on the ages and not repeated is known as Trial. A walk is ofen walk on the ventices are not repeated is known as Path. cq. viel, e201, e3 v9915-V9

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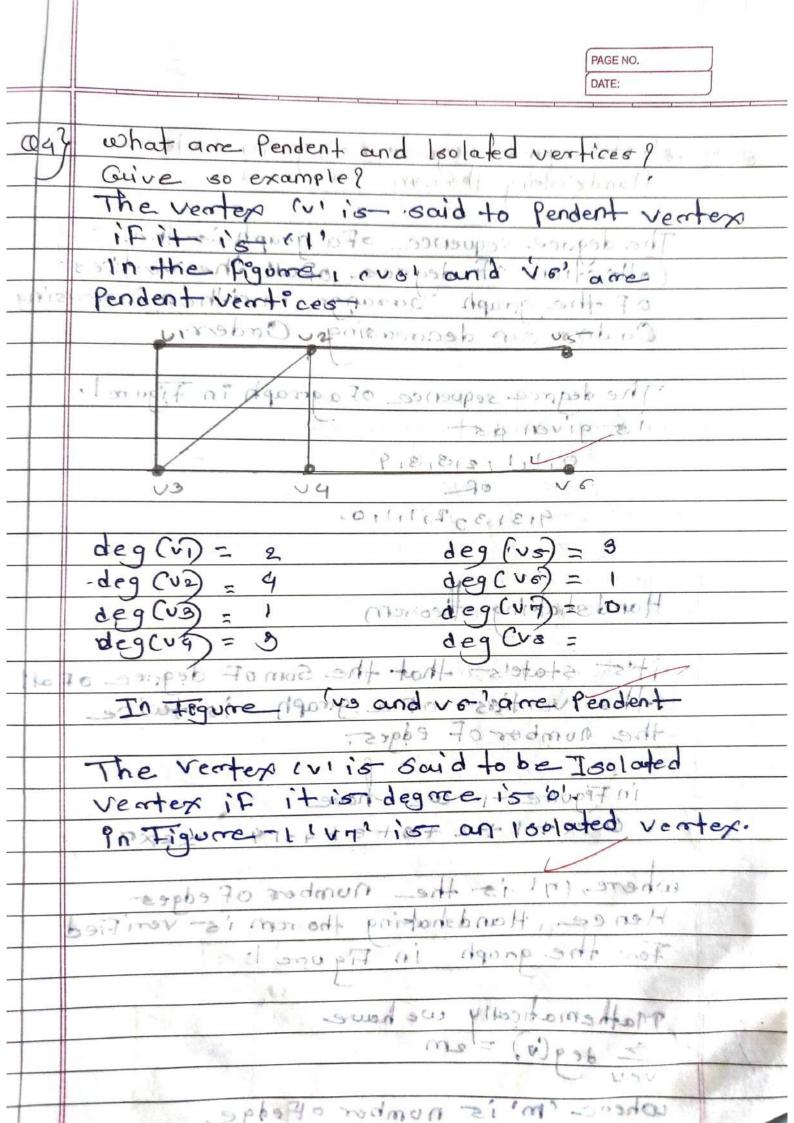
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	example - PV -p
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·b	Contradiction A Compound Propositional that is olways take is called a Contradiction. example: - PA - P
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A Compound Proposition that neither a toutology noma Contradiction 15 q logically equivalent programmy The Compound Propositions pand are Called logically equivalentif Ptyq is a toutology The notation peg orpe y quidenotes that p and a are legically equivalent. (pug) Tug pug (mnp) ug dnp y Problems 1) show that - (pua) and -pn-q are legically equivalent by by using trouth table Solotion; - The graph les sold Troth tables For (prg) and - PN-4. PUA -y COVA) ma mpning 9 F F T P show that p-49 and-PV9 are logically equiatent by using truth table.



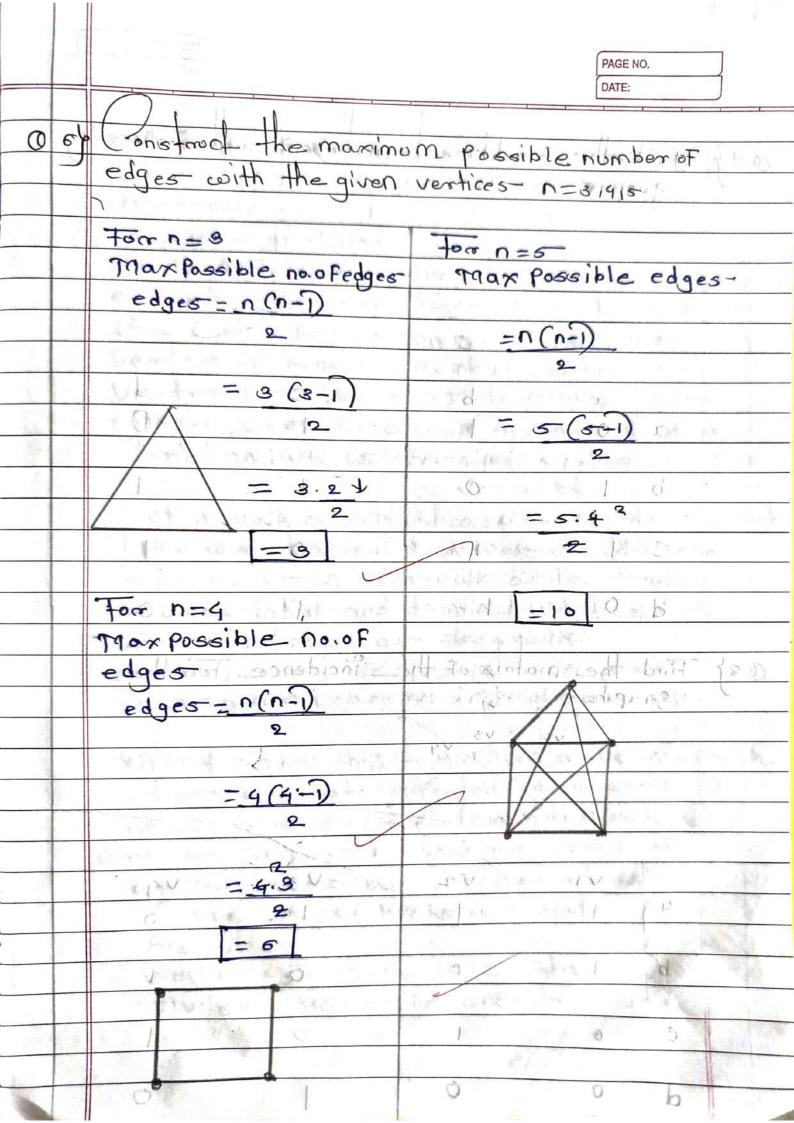
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		The Grouph which does not Contain
		multiple pages is Called as simple graph.
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	Va.	· NUII graph The graph is said to be null graph,
N. Carlot		if it ist has any number of vertices without edges.
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		· Trivial graph 1 — The graph is said to be
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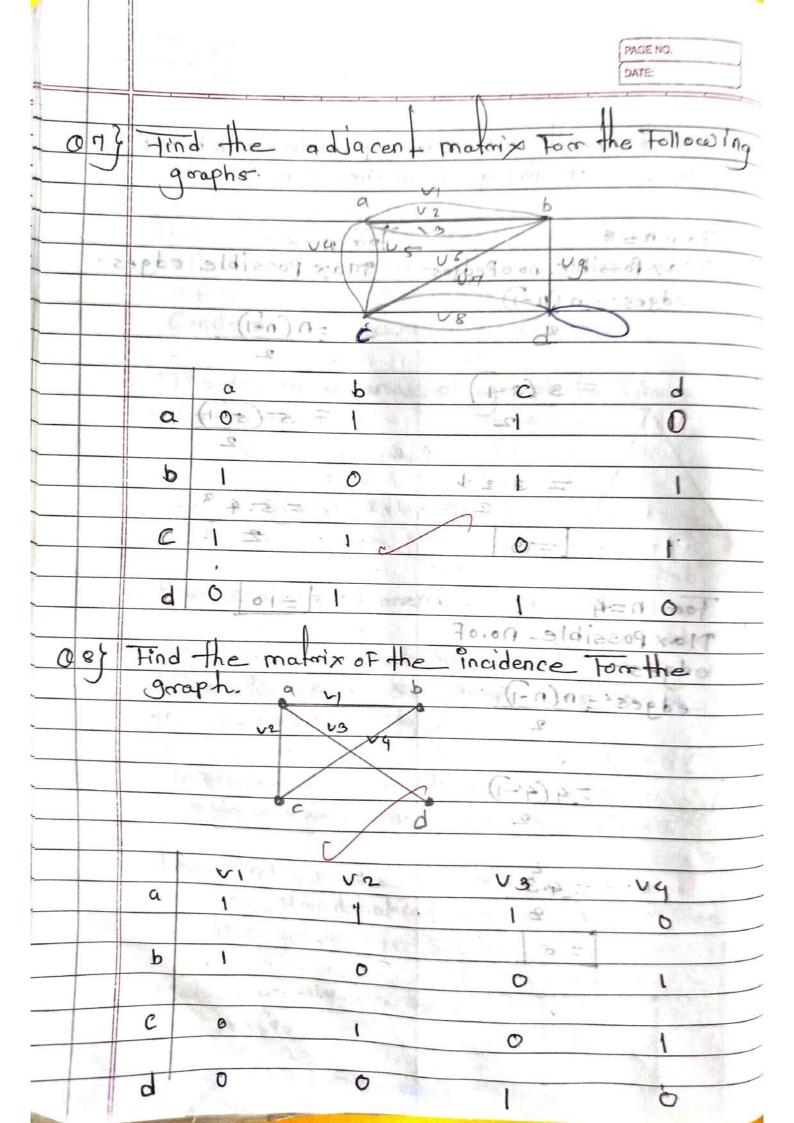
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	The degree sequence of a graph is their
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	The degree sequence of a graph in Figure 1.
	is given as
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	Hence, Handshaking III
1	Hence, Handshaking thorrem is venified
	For the graph in Figure 1.
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	Mathematically we have
	Z deg(v) = em
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	number of edge





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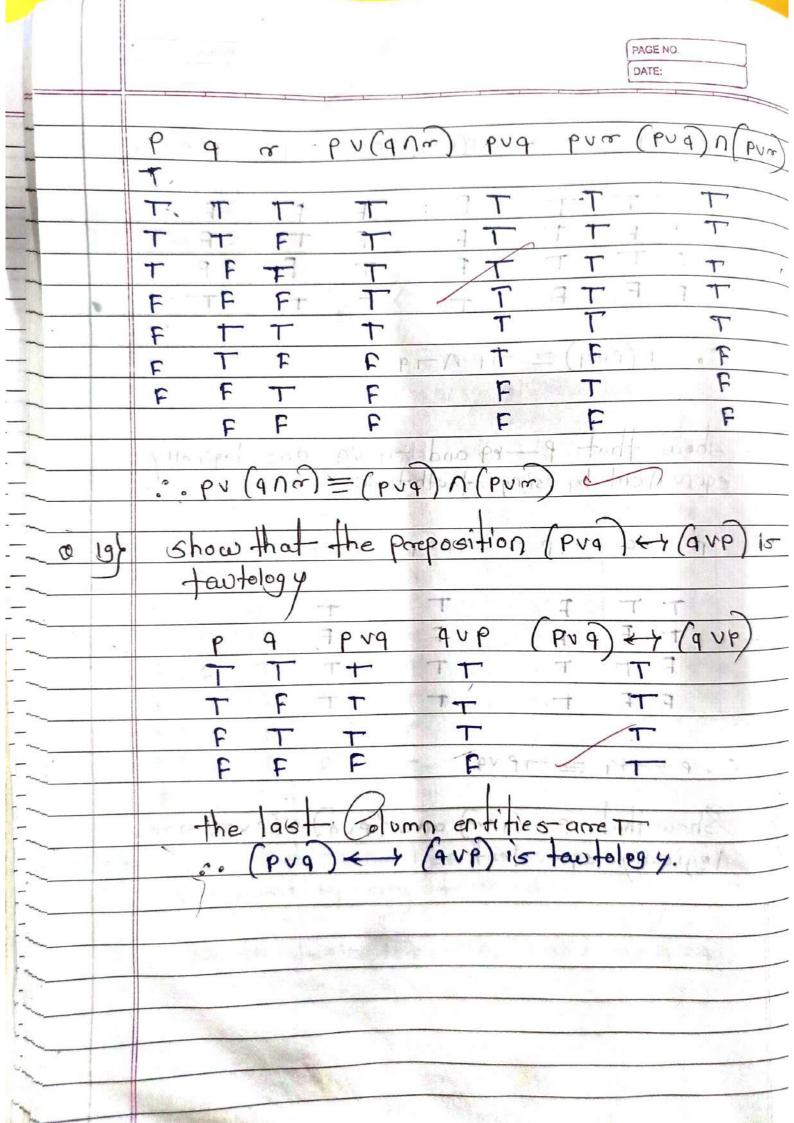
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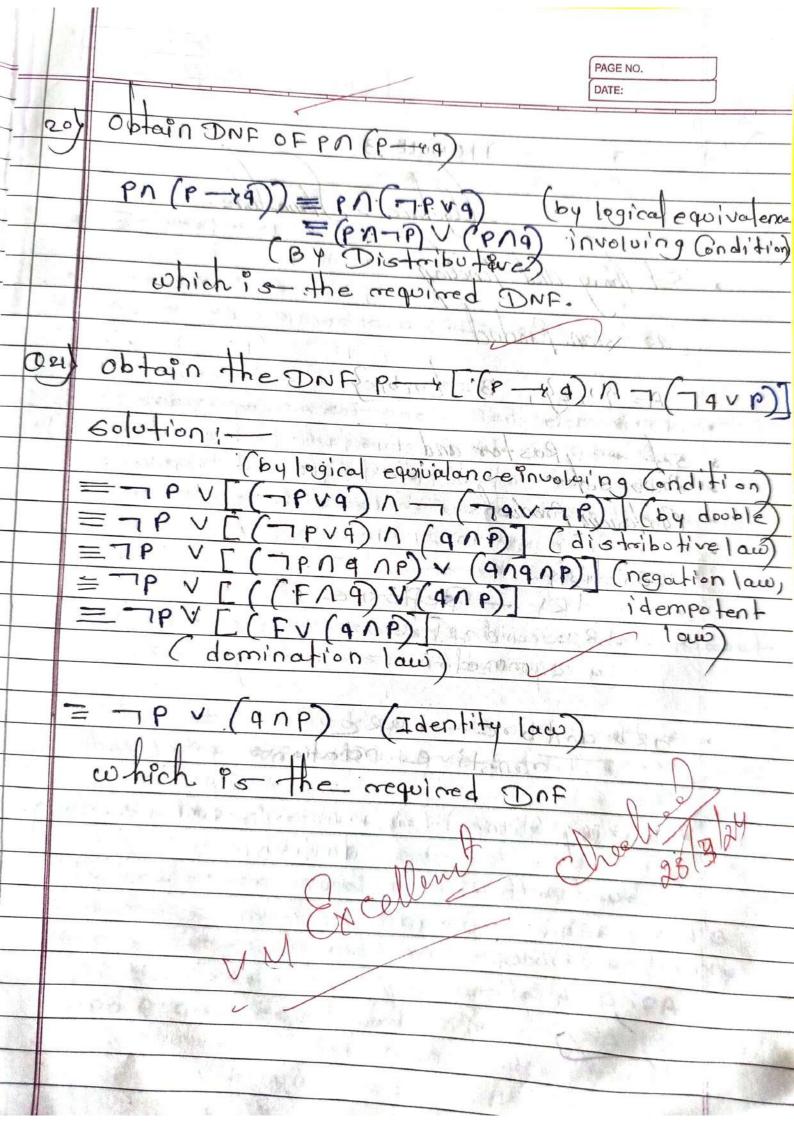
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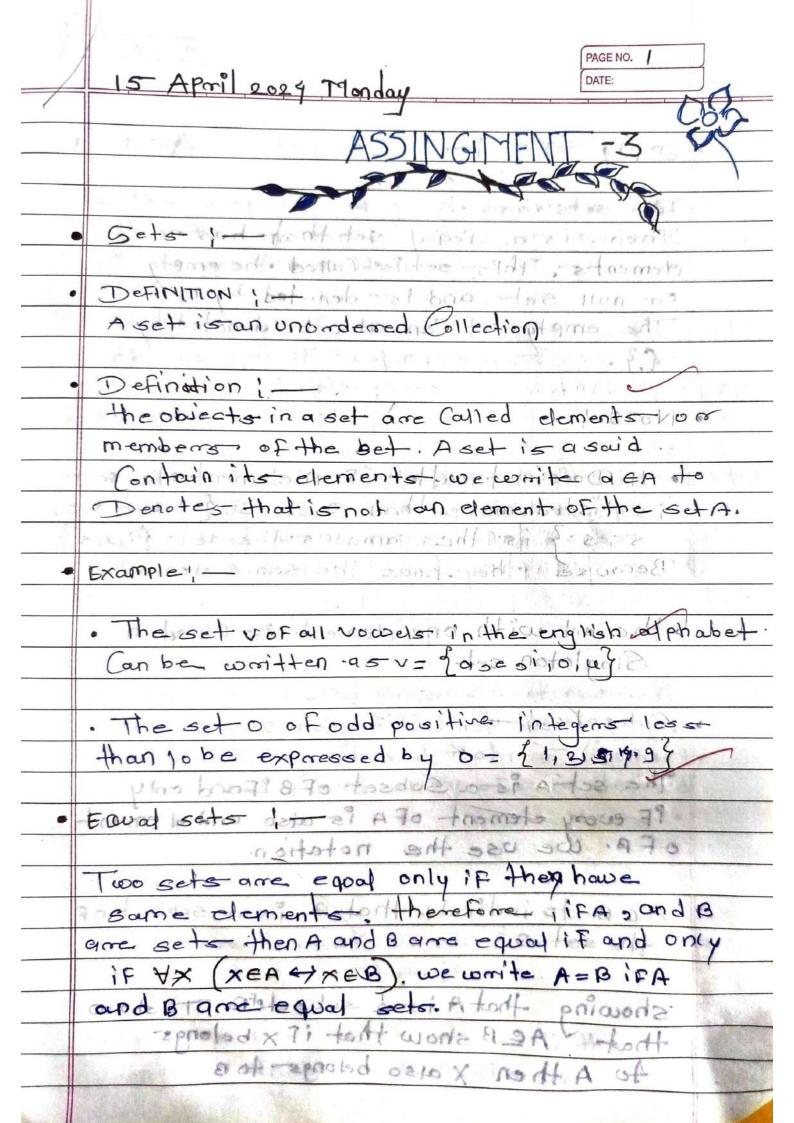
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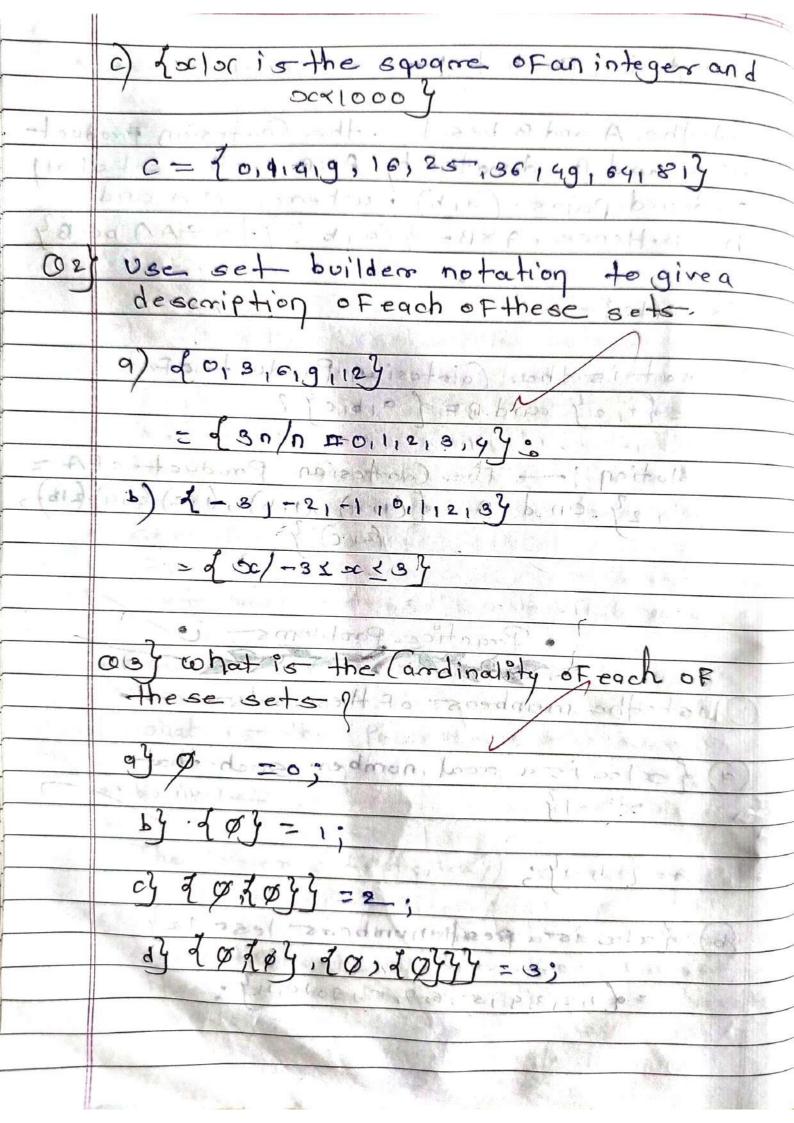
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1	A set A is called Proper sobset of the	
	Set B. IHT A is subset of a and and	
113	no Tobset A 1.e. A is a proper subset B.	6.
	Than we donote, it by A CB.	
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	The state of the s	
	A setA is a Couled proper sobset set B. if	
•	there are exactly in distinct elements ins	_
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	Example 1- 0121 (12110) 9105 monor on	
	25,1,0 + 90,-orthice > 2	4833
	· let A be the set of odd Positive integer	5-
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3121	olet spe the set of letters in the	
	english alphabet then Isl = 26	

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•	Infinite !-
	A set is said to be Infinite if it is not
	- Hinitestai sulting bbs the 70-too
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	· Example ! or more than the
	the set of positive interger is infinite.
è	Hope of modernal proclar, to 7/ the
	· Universal setstmen from to too soll 7.
	The universal setu, which Contains all the
	Objects undem Consideration
4	· Power sets for Ballion and A top A
	Quiven a set s, the power set of s is the
	set of all subsets of the sets. The power
	set of s is denoted by prof
4	if a set has helements, then its power
	set has of sis Denoted by
	. If xample for dos 199009 botto) us 21 Ato 21 A
1	- thence and exactly in distinct elements in
\parallel	(Dochat is the Power set of the set 10,1,2)
11	of er. the formal phy of end denoted
	·Solution !
	our service with motor or
	The Power cetp(0,1,24) is a set of all
	5 ubsets of 9 0,1,2}
	o let A be the ect of odd Positive integra
	Note that the empty set and the set
	itself are members of this set subsets:

of the spector sole in the sale to the

onglish apphabet then letters

· (Antesian product let the A and B besets. the Cantesian Product of A and B denoted by AXB, is the set of all Ordered pains (a,b), where a e A and BeB. Hence, AXB= {(a,b)} | qEAN beBy porion in production mobilized actions. · Example 1 - att 10 dono 70 gotgic O what is the Cantesian Product of A = d1, 2 g and B = of a 1 bic g? Solution ! The Contesian Product ofA = 1129 and B= ((114), (1,6), (12) (219) (16), Proportice Problems D List the members of these sets. a) of oxlow is a real number such that A= { 1,-143 2 B 2 1 1 6 4 D B (b) falo is a prositivenumbers less 12} = d 1,213,9 15,6,7,8,9,10,119;



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094 Find the power set of each of these sets, where a and b are distinct elements. a) day - abor (a) = { \$ { 9 { 9 } } }; by d a, b } poline batho who and of ban A tol El - WVA - Holar of 2000 A = { 0 40} 2 403 } 2 403 } of d \$199, 19, 19, 1933 Q5 tind A2 iBipar - 22 Hours of par Ho. 70 - 100 solved is the set of students attached a) A= 1091, 33 30 LOM 5000 00 1 in them offer contin Comp. Tem swift ce A = { (0,0), (0,1), (0,3), (10) (, (1,3), (8.,), (3,3)} evers & seporto & salling. in; all more by A = [1,2, ab] -+ and a hand + tothe set ans other

 $A = \frac{1}{2} (1,11), (1,12), (1,19), (14), (211), (212), (212), (212), (214),$

· Set operations:	1 . sel ball
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Example !let A = { 1, 8, 5, 7,9 } and B = 2,2,416,8,10} Because AnB = p, A and B are Dissoint.

· Union ! -

A and B be sets. the union of the sets.

A and B, denoted by AUB; is this set the Conteins those elements that are either A or in B, or in both litis denoted by AUB = { x/x CAVXCB3.

· Example! -

- The union of the sets of all Compoters

 Science majors at your school and the

 set of all mathematics major at your

 School is the set of students at your

 School who are majoring either in

 mathematics or in Computer science

 Example;—
- · INTERSECTION.

Example !-

let A and B be sets. 21, 9, 53 and (1,2,3)
15 the set 21, 8,3 5 that is 21, 3,53
A 21, 2133

= d 113 } and (old) (b d)

· let A and B be sets. the Intersection of the sets, A and B, denoted by AnB is theset Containing those elements in both A ANB= {xlaceAnxeb}

· Difference of sets

o body as Heriotel & Halland . mo more

let A and B besets the difference of A andB. Denoted by A-B. is the set. Containing those elements that arre inA. but not in B. the difference of A and B is also Couled the Complement of B with respect to A. it is denoted by A-13 thus: A-B= /20/00 EA and oce B} is manager Diagram of Diagrams a

Example! - the difference of of 1/3,5% and 1., 2,3 /2 is a set 1853 = that is \$1.3. - 21,213 = {5} this and 21,2934 and dissist which is a set dezy

· (omplement of A set 1

let ube the universal set. the Complement boffeset An Denoted by A liture Denoted by A thos a merce of Mar and and to morpe id as

alaua a 70 m · Example i

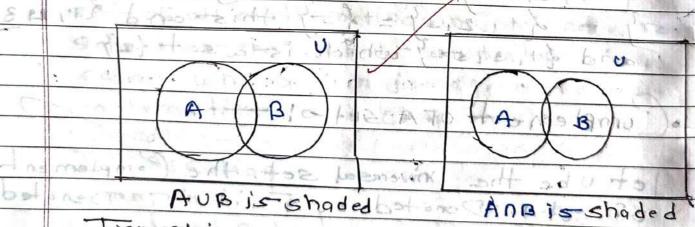
1) let A = La, eii, o, 47 (where the univ	erssal
1) let A = La, e, i, o, u) (where the univ Set of letter of the English alp	nabet
orthaning those elementes in north	
A= 2 bicsdstagihisikiliminip	1912
5, t, ww, x, y, 23,	

· Distinite sets 1 = 90 months

Two sets one Couled dissoint if their intersection is the empty bet. the same the same and safe to the same and safe to the same

· Venn Diagnam on the prince

b to the in B. Hite difference of a cond i A venn Diagram is a protorial representation of the set. the universal setu is normally responses ted by a recording le and its subsetas Circles inside it. Venn Diagnamm age Useful in underestanding relation among Seter and operation on set



tigore1: Venn Diagram of the

Figure 2.

union of A and B

Venn Diggram of the Intersection of A and B.

I STORY TO

1) let A = 2 a, e, i, o, y (where the universely set of letter of the English alphabet then al entiremple

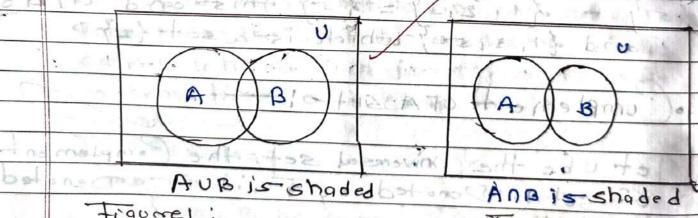
A= 2 bicsds FigihisikiliminiPiging s.t, ww, x, y, 23.

· Distiointe sets 1 - 90 something.

Two sets one Pouled dissoint if their intersection is the empty bet.

· Venn Diagram of the count of principle.

A venn Diagram is a pictorial representation of the set. the universal setu is normal. responsented by a recording le and its sobset as Circles incide it. Venn Diagrammane Useful in underestanding relation among seter and operation on set



tigornel:

Venn Diagram of the Venn Diagram of

Figure 2. union of A and B the Intersection

of A and B. 1 Stynex 3

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Fxan	Pla	21	_
C	, , ,		

OIF the Function Firsdefined by F(a) = 22 + an the set 1-2, -1, 0/12/4. Find the range of another a to the property and A bond A

clement of a to the other

Solotion 1- to an place on a si sol- 4 month

$$F(-2) = (-2)^2 + 1 = 5$$

$$F(-1) = (-1)^2 + 1 = 2$$

Therefore, the range OFF= 21,2,5}

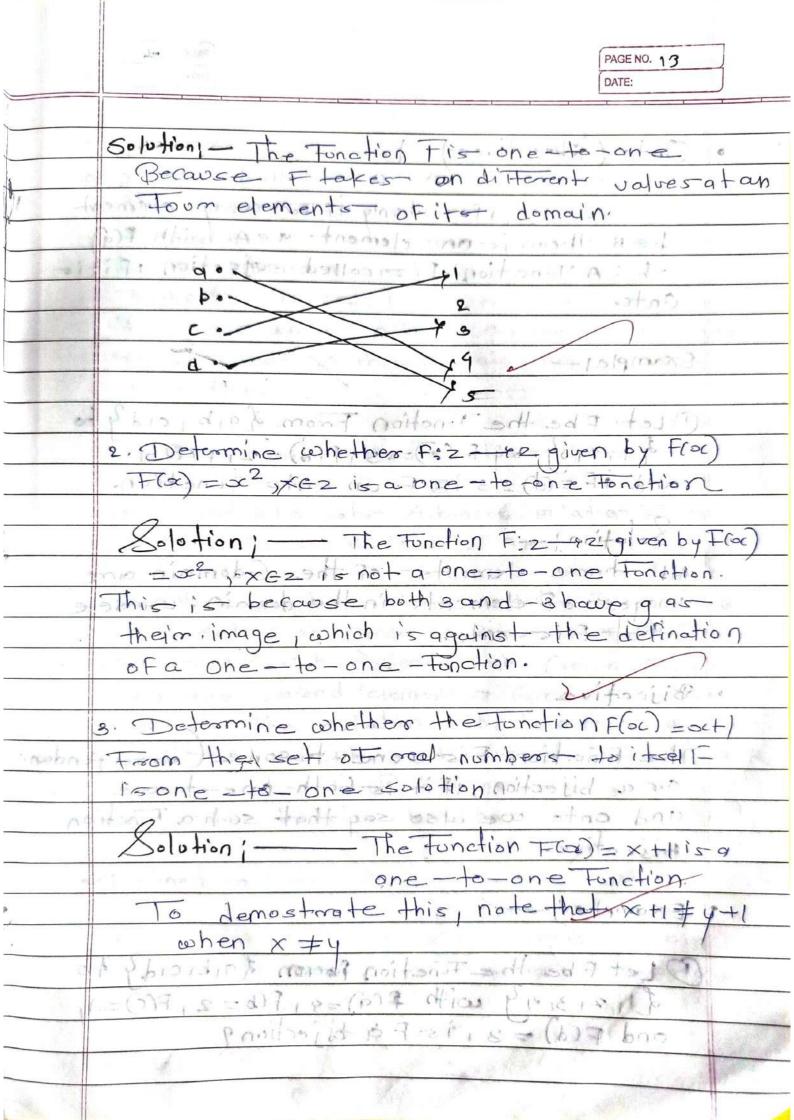
denotion and motions also contend maying One to One (Intective) 12

A Function fis said to be one to one noman injective, if and only IFF(a)=F(b) implies that a = b For all a and b in the Domain of Fine. Distinct tlements should have Distinct Image A tonation is said to be Injection if it is one-to-one

· Example! -

Determine whether the Function & From da, b, c, dy to 2 1/2/3/4/54 with F(a) =4 F(b)=5, F(c)=1, and

FCd = Bis one-to-one.



Onto (Sweetives) !
A Function of From A to B is called onto 1 org

Surjective if and only if For every element

be B there is an element a eA with Figh

=b: A Function fis called sweetien if it is

Onto.

Example 1-

O Let Fbe the Fonction From 291b 1 cidyto 21,2139 by F(a)=3, F(b)=2, F(d=1) and of=(d)=3 iB F an onto Fonction.

Solution ! - I month of

All three elements of the Codomain one images of elements in the domain, we see that fix onto.

· Bircetive

The tonation fis a one-to-one corresponded on a bijection, if it is both one-to-one and onto we also say that such a Function bijective.

Example!

DLet F be the Function forom faibroids to \$1,2,3,43 with f(a) =4, F(b=2, F(c)=1) and F(d) =8, is Fabiliection?

The tonation fis one-to-one and onto. It is one to one because no two values in the domain are assigned the same Fonction value. It is onto because all Four elements of the Codomain are images of elements in the domaig. Hence, fisa. bijection. · Perofeet of Pelations · Relations and their Properties ! A solder to a congset A is colled soften. let A and B be sets. A bingry relation From A to B is a subset of Axb. in the property affector of In other words, a binary relation From AtoB is a set ROF ordered pains when the First element of each ordered pair Comes From A and the second elements Comes From B. we use the notation arb. to denote that (916) er and arbito denote that (916) & R Moraver, when (aib) belongs torsais said to be realated to boby Rio Holar 15 commencer (alp) e-p. and (bid) e · Defination 100 100 100 100 100 100 100 11 A relation on a set Aira relation From

A to A. In other words , a realation on a set Air a sobset of AXA

· Example !-

PAGE NO C DATE:

0	Define quelation between two sets As
	25,0,73 and B= { x, y3.
	of no bring and - one - i potant all
23	· Solotion ! _ ifA = 5, 9, and B= xiy
	then the subset p= { (51x), (51y), (6)
	= 0.000 d otro - 141 .= . (614) }is a
2.5	melation from A toBo / transla
	of elements. In the denient, Hence, Fred
	bile chen.
•	Properties of Relations:
	of elation = and them Properties !
•	A relation R on a set A is called reflexive
	if (a) a) ex tom every elementer EA.
	Ata Portados por i A ot A
•	A relation · R on a set A is called symmetric
1.1	AR (big) ER whenever (aib) CR Forall
	is a set post andered pains extendition
	element of each condened pain comes trum
	A metation Ron set A such that Tomall
	916 eA, if (916) ER, and (6,9) eR, then
4-1	9=b 1st colled cyntisymmetric.
	Moraver when (art) delonger to Romis-
•	A relation Ron set A list railed transitive
	if whenever (916) er and (bic) er
	then (aic) ex torall albe Anitalia
	A me ! - Hod on a set pie a melation them
m 2	Apto In ofthem wounds. or medation on pho
	Air on the total

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O	* Example 1-	parten int
	I male and a second	11-10000
	1. Consider the Following me	lations on { 1,2,399.
	a trans a mort had a private to the first of the	id-1 - 48
•	R1 = { (111), (112), (21)	7, (2,2), (3,4)
	(4) (4) (4) (4)	100 100 feet on 100 m
bno	ille of the that both i'd	printly ins
•	Re= {(111), C12)11 C211	ا ا ا ا
(5)	in drag todt stade of the orth (1)	2501-31 41
1 ***	RB = { (1,1), (1,2), (1,4)1	211) 1 (212) (313)
	100 HO (411) HI (414) 1000	1 Dans A
		A. A
	R4= 2 (2)11), (3), (3)	
E War	these relations there is no	As who your
+•	R5= 2 6 11 19, (11 4), (6113	1) my (14) 1 (212)
w Hail	0 sat at pro(6 2 (3) d) brace 24	9),(3,3),(3,4)
	(9,9)9	say to a subject a
	ndire and townsitive. For each	1 Pa Rs - 1 Ch
4.	Ro= 1 (314) 3, which of thes	e petations que
8.4	cetterive isymms	Tric (on Tisy mine)
(and transit	ive 2010
	2 PAIDTON TOTO	2-,06 5215
	· Solotion !-	
bon	(312) and (212) second	301-2110-54
500	the reclations its and Psi	are mefferible
	be cause because they be	the Confein
	all Pains of the From	
~	(1,1),(2+2),(3,3) and (4,49)	
N.	relations are not reflexive	100000
1	do not contain all of these	
	pains. In Particular RI (Re, Rs,	Ry and Ro

are not reflexive because (513) is notin ony of these relation Too enorthlass paissollat At robiens the relation R2 and R3 are symmetric because in each case (bia) belongs to the relation wherein (a16) does for R2, the only thing to check is that both (e) and (112) are in the orgination . For Rs it is necessary to check that both (112) and (211) belong to the relation , and (1) 9 and (417) belonge to the relation. Rairs and Re ame all antisymmetrice for each of these relations there is nopaly to Fielementia and besith of \$ soch that both carb) and (big) belong to the relative RgiRs. and Rs are transitive. For each of these orelations, was can show that it terms is to tomansitive by verifying that if (grs) and (bic) belong to this relation, then (aic) act so does, For igstance 189 is nottoles transitive because (012) and (211) (912) and (21) (413), (311) and (415) and (312) are the only such sets of pourins, and (811) (417) and (412) belong to Right the the person of man (e) a) e (e+1)

Assignment-9

module - q

Relation and Partially ordening

· matrix ocpresentation.

sie A= daibicid god.

1 61+ Bo = dep 21/3 3 4 of probad

RZ & (a1b), (a12), (c13), (d12) 3

· Relation Matrix

A relation R From a finite set x to a finite set of

y can be represented by a matrix is deled

the relation matrix of R let A = 1 and 2 as a my

and B = of birb 2 i bny be finite sets Containing

m and n elements - respectively, and R be the

relation from A to B. Then R can be represented

by an mxn matrix MR = | mil , which is

definied as tolows:

tomb = staine a same of nothulad &

1. suppose that Are display and B = d 1,2 Let R

be the Relation From A top Containing (q1b)

if a eA, beb. and a > b. what is the matrix

representing Rifai=1, a 2=2 and as = 3 and

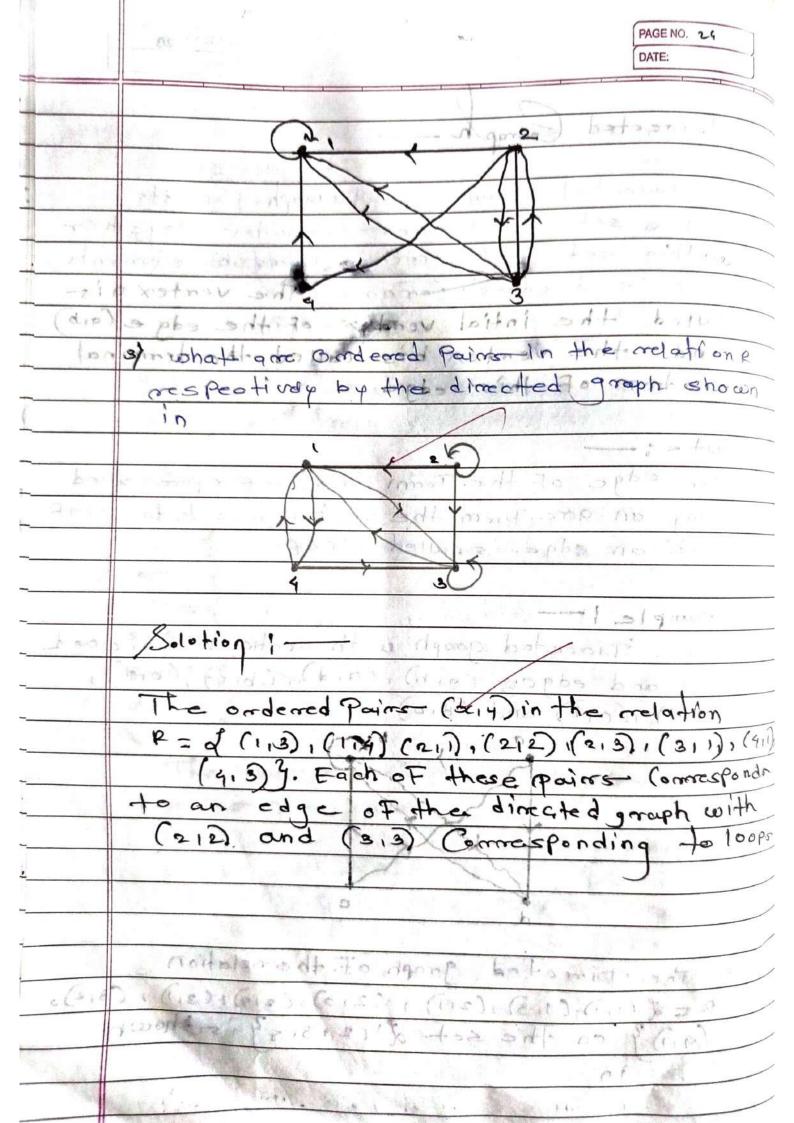
bi=1 and ba=2?

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		0.			
-		Solution	n -	P- alaham	
		Because	Because R= 2 (211)11(8) 1) (1812) 3 of the materix		
$\int \bot$		OFR	13)		
Γ.	For the state			prototo ser per militare	
	一样 60	MR =	0 0	Then 15 in MR show that	
			1 0	the pains (211) (311) and (312)	
			1 1	belong to P. The os show that	
		S(2	16):	Enoothers Pains belong to R	
			xinter noito:		
	(00			2 (93) } and B=d b, be, be, by	
		+		Pains barne in the relation R	
				y the matrix MR = + 101	
~				The ad fadjed, id be	
<u>,~</u>		of of the			
~	わ分り			nont exale A grand Dail.	
		1000	1 0	The art xintern nom or	
-		8 11		May emploited as a light	
	-			- Because & Consists of those orderd	
		Pairs (aiobi) acoith mis =1, it Follows that			
·	R = of (01,6), (92,6), (92,6), (92,6), (43,6), (43,6)				
,~—	· .	3-	1		
1-	9			the relation Rona set is	
 				by the matrix MR= 110	
			The second secon	ited by the matmixet 1 11	
			THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.	+ A mont neithbright 194 5d	
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	Though	The state of the s		to the state of th	

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	3			
	& Late			
59	Solution! Because all the Diagonal elements			
_	are enal to 1 Dis-			
	inchite imoreover, because me in summeton			
	T to lows that R in a second it is also			
	easy that other is not antisymmetric.			
7.				
049	Find the matrix representing the relation			
	R* 1 where the matrix represented Ris			
2	TAR - the Compositione of the 10 - 10 = 17			
	OII manhor with home and			
	100			
	The state of the s			
	Solution 1, The matrix tar R2 is			
30 1	MR2 = MR[2] = 011			
	111 1			
	010			
	The second comment of the second of the seco			
05	Let R = { (1,2), (3,9), (2,2)} and 5= { (4,2),			
	(215), (3,1), (1,3) }. Find ROS, SORIRO			
	(SOR), (ROS) OR, ROR, SOR, SOS and (ROR) · R			
16110	The matrices of the above composite out			
	Dolution; - airen 2=2 (112); (214), (212)			
	and 5 = \$ (412) ((215) , (31) , (113) 4.			
	205 = 2 (115), (312), (215)			
	· 50 R = d (412) , (312) , (114) }			
	Ro. (50R) = d (312) = (Ros) 0R			
	5° R = 2 (412), (312), (14) 3			
	p & p = of (1,2) 1 (2,2)			
	505 = d(415),(313),(111)}			
vita .	(ROR)OR = { (112), (212)}			
77.3				

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00 5	* Example: Let A= 1 a 1 bic &, and P and & be
/	relations on A whose matrices are as
arton	mairen below:
00	west +1 statements their site of the or sweller.
	int me = 1100 11 and me = 101 d al
The state of the s	1 1 1
4 0	Helse sit opation x inton on the hair
1	21 4 balmanagan xation att another 1
	Find the Composite relations ROSISSPIPE
<u> </u>	505 and their matrices
,	8 10 9 11
	Solution:
	R = 2 (a,a), (a, e), (b,a), (b,b), ()10
	5 - 4
	6.2-d
	50 R = {
(3,4)	JROK528 ((0,5), (8,8) ((1)) b = 9
Carrier T	9 80 85 30 9 PULL & COUNTY (COUNT) (COUNT)
9-(49	2) book - 202 (- 10) x = 10) x = 10) (40)
	The matrices of the above Composite related
	and last given below to the maine
	· 1 (6,12) ((2,12)) ((3)) ((3))
	19 ROS = 169 (18) (18,1) 6 (10)
	(+19) (ole) (o M) sor = 9 0 101 3
	() () () () () () () () () ()
	1 (m) 1 (m) 1 (m) 1 (m) 2 = 9.3
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	MRER = (1/47), (8,0), (-12)
U	11/201/201/201/
11	



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Eduluations 1/-

act of grands, if e - ped site with A relation on a set A is couled on equipolence relation if it is reflextive, symmetric > and transitive two elements a and b that related by an equivalent element with respect to a particular equivalence relation.

Example!-

=> Pistorfexime 1. let Rbe the relation on the set of real number that arbifand only if a-b is an Integér 15 Ran equivalence relation.

Solution! -

i) Because a-a-ois an integer forall the mat numberes attara Formall real Hence, Ris reflexative.

Thus the relation Rise Symmet ii) Now suppose that arb

then a-bisan integer so b-airals o Integeral - 1 - 1 - 1 - 1

Hence bra

it Hollows that Ris symmetric. E 4 d & l d is in ip = 21 (.5 - 4) + (4 - 5) + -

iii) if arb and bra then a-b and b-came Vinteger.

Hence jarc.
The sty pure francitive in sitt somet Consequently , RIS on equivalence cretation

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9	1 Let x=d 1,213 17 7 and R = of Goly Dyxy
	15 divisible by 34 . show Ris an
2	Let x=d 1,213 17 and R=d Goly Dyxy is divisible by 3y . show Ris an equivalence relation.
-1	Solution;
17.00	1 38 5013 60
36473	1) For any x ex x-x=0 is divisible by 3
	··×R×
	=> R is reflexite.
	and and is policy and ada the part
	mander that apply to the reduced
	11) tom any x, yex, if x Ry ithe x-y belowable
	by 3.
	- noitule
	+ - (x-4) 15 divisible by 3.
	y-x is divisible by 3
	-yyx
	Honce, Pistroflowative
	inos ithe relation Ris Symmetric
	Mous supposes that are
	pril and the company of the company
	(iii) For any x 14,2ex slet xxy and
	JRZ JAL JAL
	of the same of the
	- 1 (x-y) + (y-z) 15 divisible by 3
200	May 15 atong ble by 8 dan 1
	xRz (xo) only
	Hence the relation Ris transitive
	relation
	relation

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00	Soppose II
	Soppose that Ris the melation on the set
	of stroings of english letters such that
	is the length of the store such that
The state of the s	is the length of the strings x. is
ar	Ran equience relation 9
	Solution
	il Because III
	i) Because (a) = 1(a) i+ Follows that ara
10	wheneverais a storing, so that pis
	reflexive
	ii) Next, Soppose that arbs, so that 109)
	=1(b) then bra because lob) = la)
	Hence Risasymmetrico (5)
	nother set of integers 2
	i'i' > Finally, suppose that arb and brc.
	then il (a) = off) and I (b)= l(c). Hence
	. L(a) = L(c) , so arc Consequently, Rin
5	11 Horancitives 110.70 to and and site
	15.3 = An aiothora.
	Because Pis reflexive, symmetric and
	transitive; it is an equilence a relation.
	1 = 9 - trottolen is it
	es in repair every integer as it
0=	post send base de promond based of the
-1/10	sommulations - i's not-Lolar site and

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Partial Orderings - 9 toda nous - mottal it ilpina Te - trois Arrelation Ron set sia colled a Partial otrden relation pistitis reflexive, antisymmetric and transitive.
A set s together with a Partial order. Ris couled a partially ordered set on poset, and is denoted by (s.R) Members of same (alled elements of the poets, pain - 10 12 10 mallerial · Example !-Let z be the "greator than on equal" relation (2) is a partial Ordering on the set of integers 2. 100 d 40 - 40 - 400 09993 115 olution! 2 be the set of all intogens and the melation R=1>1 cevis off in the 11 Since a La For every integer the relation R='1' (1) Leta and b Form every integer a, Let Pb and bra - a a bb and bra = a ·. the orelation 'L' is anticy moret

	814.7	PAGE NO. DATE:	}
	iii) Let a, b and c be any three	interens	۸.
	/ Letarb and bra 2 a 2 byo	- a=a=b	
4.3	of and 9 1 to a sound service by	0	
	mentine relation of zi's trans	stive Since	e
(The relation 2 is reflexi	ve, antiey	
	mmetric and transitive, " Z'	is- Pantia	
	Ordering on the set of integer	us	<u> </u>
		4.	
	therefore (2%) is a Poset.	Who Each	
	tob no or mo	Mr. man	
		_ 1 1	, , -
(eQ	The divisibility melation is as		teming
20	on the set / OF positive inte	,	
	dine is down betteres x		B .
	Solution: - X-1000	7-110	
	1 1 1 1 5 0 5 11		2
	let 2+ be the set of Positi	ve integer	8
	which doesn'taindadeo.		
	y by single line.	Horrib	٦,
	Since if a/a torrall a 62		
		[rample	
	ii) alb and bla - 4 a = b i	s antisyn	metal
	3 d 2 brus f2. Plane into	7 17727 1 11.	
4	iii) alband ble - ralcilis	transver	25
	it tollows that in Partia	1 2 1	
	it tollows that is tantia	Orden	<u>ng</u>
	on 2 t and (2 to Disa Pos	et.	
	1 7 7m	The same of the sa	Mi V
	A PROPERTY OF THE PROPERTY OF		
	\		X S
The second secon	The state of the s		The same of the sa

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Hasse Diagrams of store do to

denero ard Sie usabas da o del A Partial order & on a set P can be represented by means of diagram known as Hasse diagram of (P.) in Suchpeliagnamt state no prince

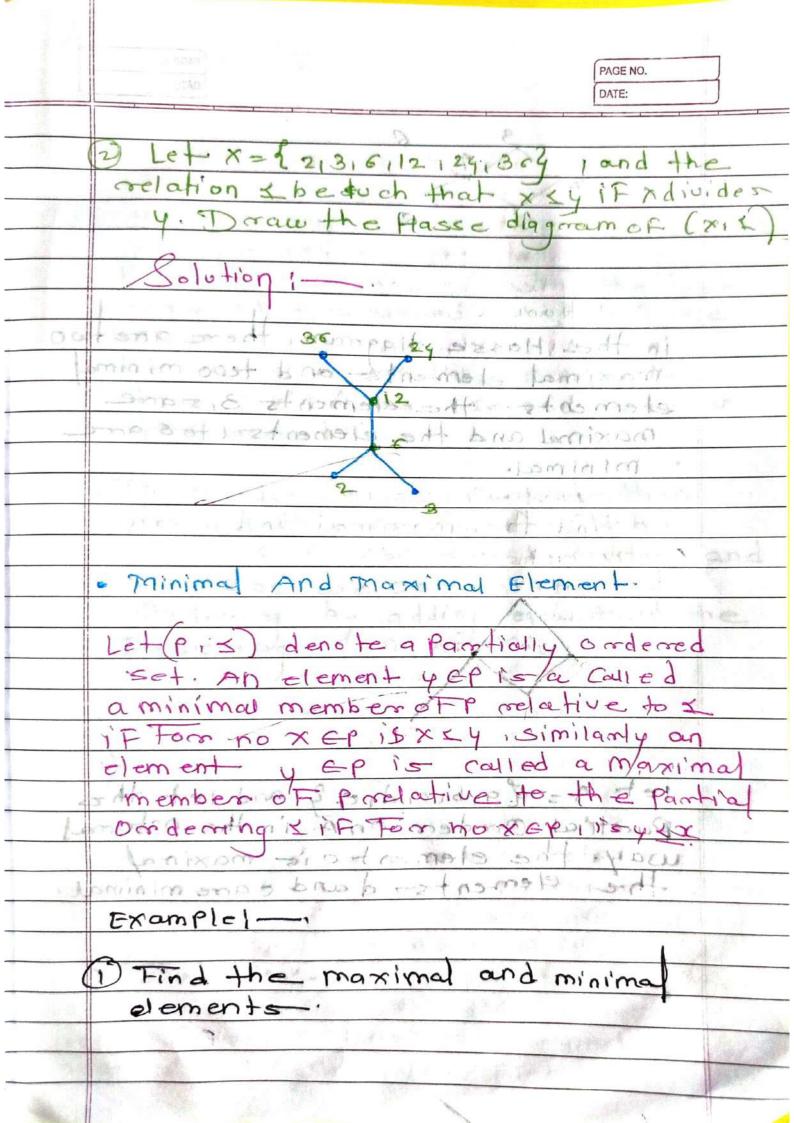
if Each element is represented by a small arela or dot

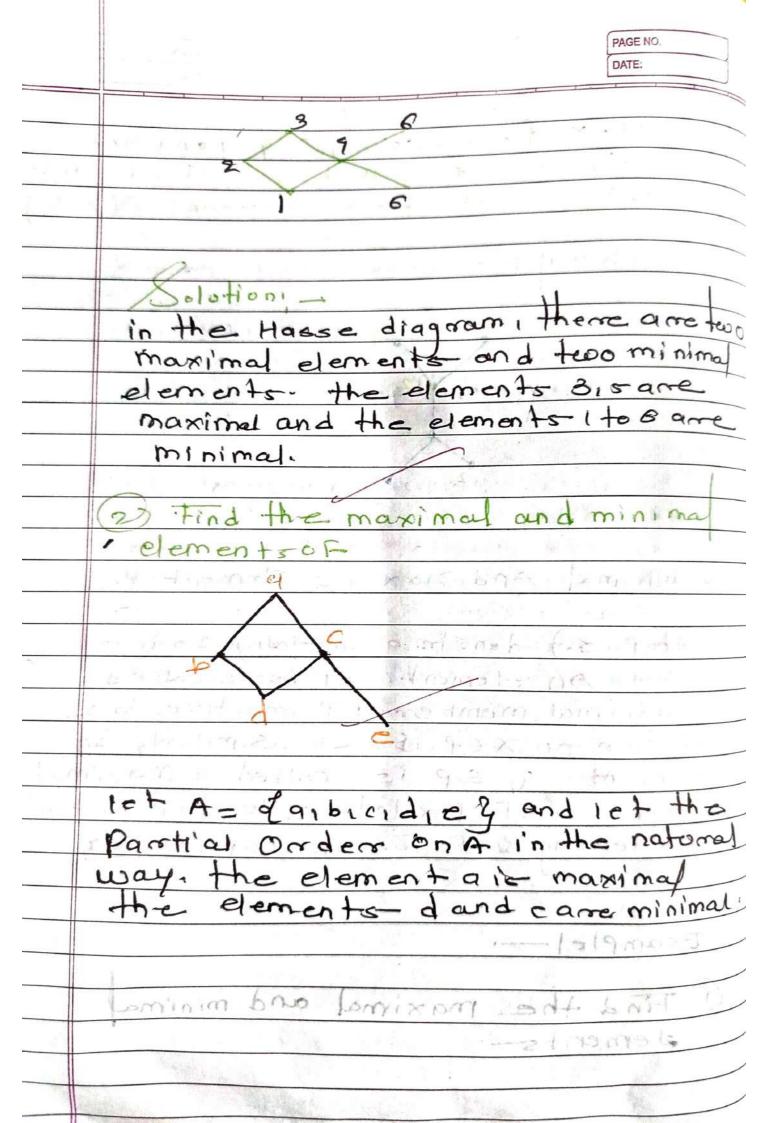
ii) The Circleston xepis drawn below the ande For yer if xxy, and a line is drawn between x and y i'F y Covers X.

ility i Frx xy but y deed not coverx. then x and y are not connected directly by single line. MUCE IN A TO TOTAL O EAST, HE PER HEXIL

Example '

1) Let P = d112181915 y and & be i an antisymmem the relation " less than or equal o", then the Hasse diagram is mobile to the it will took - curtiful -





PAGE NO. DATE: exico Graphic Ordering lexicographic ordering is defined by specifying the one Pain is less than (in Ai) the First Entry of the second pair, or if the tirst entires are equal, butthe second entry of this pair is less than (in AZ) the second entry of second pair. In woords (ana2) is less than. (bilb2) that is (aige) < (bilb2 tither if (a, 1 bi on if both a,=b, and 92 12 b2. we obtain a partial Ordering by adding equality, to the Ordering of on AN XAL Example! Jonn (4) a) 20(4) 10 the Proset (2x12), is the lexicographic ordering Constanted Faromather 4 souls relation 511 /2 019mm + of all Preside to sellie of

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	The that
_~	Be Couse 3 74 if Follows that
	(3,5) (4.8) and that (3,5) (17.5)
<u></u>	we have (919) < (411)
	because the Timet entances
1. 10	TOPI (gigg) and (4111) are some
	the second 11 super to de th
	softwar Laups one opening Herrit
	· 10/05/2029, Friday Assignment - 5.
30	portos brissos soprobabilityi) and
-	The second Palor
	Basic Probability Concepts 1-bnow
	(but the that -is- cappe) of but of.
	Random Experiment 1-) 71 months
bro	
291	An activity that produces an out come
	is referred to as a sexpeniment in
	said to be a mandom experiment is
	if its outcome Cannot be paredicted
	with Certainity
	manno de Marino
	eq.
	if a Coinist tossed , one cannot
	predict beforehand whether head or
4	fail will appear so, it is a random
	experiment.
-	experiment
	0 01 000001
a	Sample space - indition
	The set of all Possible outcomes of a
	experiment is couled the Sample space
	it is denoted by 151 for its number

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1	
-	
-	OF elements are denoted by n (5)
-	
	Example ! - to us are : troops algorit
	while rolling a die the no that
	would appear would be any of the
	numbers among 1,2,3,4,5-,6 so here!
-	102 sold to dead A = (the sold bruggma)
-	5 = { 1,213,9,5,6, 4 and ncs) =6.
-	2 tomus browness so tollos to I have
-	Similarly In the case of tossing our
-	unbaised can place place of place
-	
-	S=q Head Taily . or disty
1	tandinics) = 2000 on =1 modt 71
1	it on it made to be aldustring anomies i and
-	The elements of the sample space are
	Colled. sample points.
	Called. Strong to the strong to the strong to
-	
	Every subset of a sample space is-
	dennted by E'-
	an event 1+ 13- date
	Example! - in throwing a dice
	5 = \$1,2131415,09 The appearance
1	of an even no will be the event
-	E= 2,416 3. clearly Eis subset
-	TOF STATE IN O MISSING APPLICATION OF
	TOF STATE OF THE S
-	Types of events 1 - 12/10 mm
	of yes of war is

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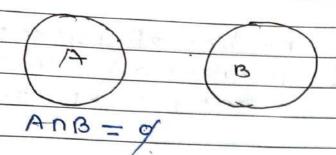
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	· Types events !-	LO .
	19125 Events	
	Simple event; - An event Consid	sting of
	a single sample point is	alled
	da Simple event	
2 9	1. 2 2 - 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	
	Compound event; - A subset of	= the same
	space, which has more than	
	is called a Compound event.	311
LO	prize of 7 saus adfinitions	(ion:
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	Events are said to be equally	likely
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•	- training a lamin-	o Has
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	One Cousty.	they

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	· Types events !	note -
	1912s events	
_	Simple event :- An event Consi	stina on
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_	a single sample point is	
210	a simple event	
_		211
-	Compound event; - A subset o	+ the Sample
	space, which has more than	one element
-	is called a Compound event.	T, 1
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	Events are said to be equally	likely
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- 2	ennoustive if they Collectively	C
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	o Sure event	
13.	let 's' bea Sample space.	PX active 1
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	o mutually exclusive ordisioint	event!
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· Independant or motocully independent.

two or more are said to be independent

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or them does not affect. The

probability of occurance or

non-occurrence of the other.

* Complement of an -event 1,

experiment and 5 be an event of Occurrence of head in the second throw : 8 the event of Occurrence of head in the second throw are independent event.

· Classical defination of Probability.

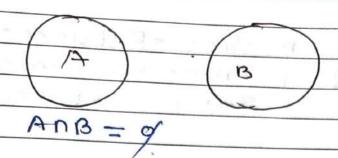
if their be the sample space then

the probability of Occurrence of an

event 'E' defined as

then El = 4 thing can heads -

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· Independant or motocully independent
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two or more rare said to be independent
if the accurance or non-occurance.

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* Complement of an -event!

experiment and 5 be an event of Occurrence of head in the second throw: 8 the event of Occurrence of head in the second throw are independent event.

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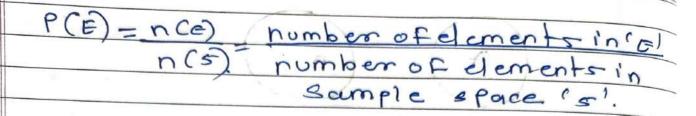
the probability of Occurrence of an

event 'E' defined as

Frency = Enth (EI)=1

(330-(13))

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- · Properties · of Probability !-
- The probability of an event-lies between (01 & (,?.i.e o spece) x1.
- The probability of an impossible event is (01 & e.p(0) =0
- (3) The Probability of a sure event i's!

 1'.c. p(s)=1, where 's' is the

 Sure event:
- ACB then PCA + PCB)
- 5) IF E' is any event and E' be the tomplement of event (EI, the PCE) + P(E) =1
- · Problem s: : signal addison
 - Event of getting out heads then FI = (HHHz; n [FI)=1

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Let Esiz	ET AVIL
Event of getting at least as	- head
the 62 = ZHHT, HTH, THHY;	
$\bigcap (G2) = 3$	
P (E2) = 3	
(see Acres me see me	4 1 12
)(c+ (E) =	1
ent of getting at least one	nead
then Es = & HAH, HAT, HTH, I	THH, HII,
THE, THE?	
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reads then Ey = &HHH, H	141, 474,
THHY?	
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h(s) 8 2	W /4
SAME TO SERVICE STATE OF THE S	Cle v
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= 9 (1 × 9 C1 × 9 C1 × 9 C4	
52 C4.	
= 256 0.0009	9

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ventof getting at least

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	high (tour honours
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Notes

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by

Vaibhavi Jadhav

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