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**Discrete Mathematics Department** 

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	Set 122 AUR It
	A loet lig that collection dor well defined object
	or things A A A A A A A A
	re.g. A = {1,2,3,4} = 1
	cardial number 9,1 pt 9
	n(A) = 4 8 2 /1
	Representation . ptaz 10 29907 #
1	1) Rooster Form
-hon	1010 2) set builder form A - 100 utam? ()
	190 primit 20 hallos 21
	A = fa: a is a natural number till 43
0	Rooster Form 192 goolgignia . 0
81	them A? Roosten Forminis where relements
	are placed in braces {} and are seperated
	by commas
	A = {1, 2, 3, 4 }
	192 Stiern (8)
(2)	Set a builder of form of april 192 A -
ofi	117 - 21A. beets builder formiteris agarde or
	statement describing common characteristic
	of all the elements written instead of
	writting elements directly in blaces
	A= ja, i, e, o, ujas support m
	time A : is a ! a delis a rowel } A
ł	upp 21 to ablance transfer as adama

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#	Sub set 10d			
d figure	- A set 'A' is called subset of B			
-	IF XEB => XEA			
	A = so, i, e, o, u}			
	B= 19, i, e}			
	A C B CAM			
ligure				
15, 4	Types of sets main and and and and and and and and and an			
ACST	1972009 C			
0	Empty set - A set chaving peno element			
	is called as Empty set.			
	in- (intrologicadenoted) by a solit A			
0	Singletone set anos 1912009			
· 2	A set having only one element is			
	called as a single tone a set . basing and			
	- e.g. A = {2} . 201000 .yd			
74	5 14 8 , C , 7 } A A			
3	finite set			
	- A set has a fix finite number of			
10	inclements l'inside it is cauled as finite			
5110	DisiGetta norminos pridicisados comatata			
	o Siergi aditivo studiste alt 110 10			
	A:= { A a bancacide} pointing			
(4)	Infinite Bet V. O. J. J. D. J. A.			
	- A set has indefinite or infinite			
	number of elements inside it is called			
	as Infinite set .			

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14					
6	Equivalent				
1					
	- If the number of elements present in two Set are equal i.e. gardian				
	number of two sets is same then				
. 115	this set is known as equivalent				
	set				
	ett podt etasapio a epit x it -				
6	Equals seturion inter 192 : 19219				
1	- If the number of elements and the				
	also the element of two set are the				
	same irrespective of the order then				
	the set is Equal set (1)				
	18.11 , 18.01 , 10.11				
1	Unequal set is english				
	- At least any one of the one set				
-	differs from elements of another set				
	then the set is unequal set.				
	- adamo (1				
(8)	i Universal reference to a nome A -				
	and - an universal sets offen denoted by U.				
	apprefers to the said that nits contains				
	all the element under consideration				
	to the specific content or problem				
	19:00 by Cop & c Arent				
Ô	Disjoint set o p. 9, by a				
	- If Non of the element between two				
•	sets are common then they are called				
	as pisjoint set				

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#	
7152.51	power set
	- power set is a set x is a
(1.))	Cal at all possible set
	x including hull set sset
-	
	- IF x has n elements then its
**	power set will contain 20 ele
wett	ond Subsets de la colonna del 11 -
6 <sup>32</sup> 0	in the spill to iterational actionality
61.321	e-granz A = 1 { 1 ; 2 , 3 } and 2000 - same
	P (A) = { \$ \$ \$ , { 1 } , { 2 } ; { 3 } ;
	{1,2}, {2,3}, {1,3},
	{1,2,3} }idd Lappano - 3
122	40 941 10 9712 FAD + 2091 1A - 1
	Fundamental operation on sets.
	109 LODIPSOU 21 192 941 a9dt
(i	Union
	- A union of two or more set is
1. B	a set that contains on the list
20101	elements of any or the lock
. 10	Horset with roland transfer and the
10	l'élégi ra tablica antionye erit or
	$A : \{a, b, c, d, e\}$
	13. 19, F 0 0
$1 \pm j$	$B = \{d, F, g, a, z\} = trioper P$
5	LOAUB SHILL AND TO THE HELL
	$A \cup B = \{a, b, c, d, e, F, g, z\}$
	= {x   x EA OY X EB}
1) E	

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2)	Intersection
	- A Intersection of
	a ou that coole
2 (	elements that are common to all the
	given bets.
	e.g .
	P: {1,2,3} <u>51,2,83 d</u>
	B: {2, 3, 5}
	$A \cap B = \{2, 3\}$
	1.3)(1.4) . (8.8) (P.8) } . 8×A
3)	DOIFFerence (1.2) (8.2)
	- The difference beth two set offen refer
	as a "set diffrence, is a new set
	that contains all the elements belongs
	to First set but not second .
	( (A - ) B ( 2 . 2 b . C . e }
	A-B: {xIXEA \$ x \$ B}
	bresttenskind 8×A
4)	Cartesian product
	- A cartesian product of two sets
	set p + set 9 denoted by P×9
	- IS a set of all possible ordered
	pairs (1,3) where I represent
	element of p & 3 represents the
	- in other words it combines each
	element from One set with
-	another set.

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	e.g. p:	\$ 1. 23		001192		64
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	1100 201001	noo lantt	1.93	19 21	81,2 <del>d</del>	
ori:	P×q===	{ (173) .	(1,4)	,0 (2 .3	) / (2 .	4)}
	1		A.	e126	ABVIP .	
#	A = {3.5			2	- N-9	
		8.13 19				
	<u> </u>	6.11}3	121		- 719	
				s <u>8</u> 1		
	A×B = {	(3,9),				
		(5,8),				6.8)
	<u>561- 96740</u>					
	0 0,000 GE		19173335	(98 <sup>-1</sup>	P. 20	
SP	<sup>1</sup> A×c∂±α∂ιδι	(3.7)	(3,6	20100C3	.i.1.29+,	
	- 10/10	29 (5,7)	165 6	SN PER	211 305	
		(6.7)	, o'C6 ,	6) 8(	6, (11)	}
		C H H N	$\{x\}$		A	
	A×B ∩	Ax( :		= \$		24
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$P \propto 4$	alga acot: udu hat	1	T			
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#	Venn diagram . (g) a cana cana a			
	D (Due 2) - 1810 + 08 - 10			
	$n(AUB) = n(A) + n(B) - n(A \cap B)$			
	OA CRIACANB)			
g .	In a class OF 40 Students 18 likes			
115.96	manematics 16 likes science & 10 likes			
440	ooth then find the students who like			
and p	either math or science			
	Had Given 19 19 19 19 20010 20010 01 2-			
	Itod returned or . Hody Hov + Hadsing			
	n(A) 12 18 = 6tudents who like Math			
	(B) ====================================			
	n (AnB) = 1020= Students who plike both .			
-				
	(LO ONCAUB) 200/ON CA) + NGB) -2NCANB)			
	= 18 + 16 - 10			
12	ADID 2 DICAUB) 17424 HABBINE COUT			
0				
<u>g</u> .	Break English or Hindi 10 people prefer			
	speaking both Hindi & English. 20 prefer			
	English How many students people			
	prefer speaking Hindi			
	n(AUB) = 50 (VU)			
	D(AOB) = 10			
	n(A) = 20			
	n(B) = 8			

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	(Frage
	D(AUB) = D(A) + D(B) - (D(AOB))
	50 = 20 + n(B) - 10
	(8/1 A50+10 (2) 20 + n(B) = (8/10) 0
	n(B) = 40 ·
st unit	
EST Q.	In a class students like to play
3.4.4	this games & Football, Cricket Wolly ball
Dat	5 students play all the three games
	20 plays Football 30 plays Nolly ball
	& 40 plays cricket 10 plays both
	cricket & vollyball, 12 plays both
市场	football & cricket, 9 plays both
33.0	Football & vollyball How many
P <sup>1</sup> 0	students arealing class : (son)
	>
	h(F) = Student who plays = Football
	= 2021 - 31 + 31.
	ncc) : students whos plays cricket
	= '40
voi His	n(v) = students who plays vollyball
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	n(B) : 62
	$\frac{3}{23} \cdot \frac{3}{27} \cdot \frac{(2000)}{(2000)} = \frac{1}{2}$
	· CBOANA - CHIA + CANA + CANADA
2	10 - 15 + 31 - 01 - 01
	Consider a group of student in School
	let A be the set of student who play
	basketball & B. be the set of students
	who play baseball. Given that the
	Cardial number of A 150 1
	Cardial number OF Bris 40 f
	n(AnB) is is Find Students who
	plays only basket ball of students
	who plays only baseball.
	n(B) = 50 n(B) = 40
	$D(A \cap B) = 15$
	$n(A - B) = n(A) - n(A \cap B) = 35$
	$n(B-A) = n(B) = n(A \cap B) =$

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2	
	at an atudents 45 plaus
	In a class of 70 students 45 plays
1	Soccer 52 likes to play baseball
	All of the students likes to play one
	of the two games
	How many students likes to play
	soccer and poseball
	How many students like to play
8	only boccer
	n(A) = 45
	n(B) = 52
	i) n(AnB) = ?
	n(AUB) : 70 .
	n(AUB) = n(A) + n(B) - n(ADB)
	70 = .45 + 52 - D(AOB)
15	D(A0A) : 45 + 50 - 70
1.01	
27	
•	
	i) D(A-B) - P
	$\frac{1}{D(A-B)} = \frac{1}{2} \frac{1}{D(A-B)}$
2.d.	IILA) - O(A'DB)
2109	$\frac{h(R-B) = n(A) - n(A)nB}{Fc - 27}$
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	Paulo Callaig Silar
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	NOR	1	P19
	(NOT + OR)	*	
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		$P \rightarrow (q \rightarrow$	$r) \equiv (P$	$(nq) \rightarrow \gamma$

	Methods of proof (up) instagmabi
	AND A THAT A MARTINE A
	Disjunctive normal form (PNF)
	- DNF express a logical formula as a
	series of on operation (minumwith in
	parenthesis, where each grouping
	represents the condition under which the
	Output
	This form is which avitable A
	$(\gamma \vee P) \vee Q \equiv \gamma \vee (P \vee Q)$
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2)	conjuctive
	- CNF is opposite OF DNF DNF 1919
	- It expresses a logical Formula an
	series of flogical operation whithin
	parenthesis where each group represents
	a certain condition under which the
	output a is false. and and
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	- (PAQ)
	$(\sim P \vee q) \wedge (\sim P \vee r) \rightarrow q$
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	Idempotent law	1
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	$(P \vee q) \vee r \equiv P \vee (q \vee r)$	-
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	$\sim (P \land q) \leftrightarrow \sim P \lor \sim Q$	
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	pistributive law stiggge at 242.	
1	PN (QNI) (PNQ) V (PNY) II	-
	$P \times (q \wedge \gamma) \leftrightarrow (p \vee q) \wedge (p \vee r)$	-
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	Page
#	Predicate stand about
2	- A predicate is a sentence that
144	contains a finite numbers of variables
	and becomes a proposition when a
T	Specific values are substituted for
· 1	the variables where p(x) is a
3	propositional Function or a predicate
t"	and a is a predicate variable.
1	T T T T T T
#	Domain T T T 1
4	- Domain of the predicate variable
	is the set of all possible values.
	that may be sustituted in a place
	of variable
	· · · · · · · · · · · · · · · · · · ·
#	Universal quantifier (Y)
	- The Universal Quantifier (V) is
	used to make a statement that
	applies every element in set. It
	is often represent that for All For
	Every
#	Existantial guantifier (3)
	- The existantial quantifier denoted
	by J
	- Is used to make a statement that
	assents the existance. OF at least
-	one element in a set that satisfy
	o perficular condition
	Condition

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	- It is offen referred ous it is
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	Law one wat die genteers die
ବ	het D = {1,2,3,4,5,6,7,8,97
	Determine the truth value
C.	the ended of the trace smell the construction of
- 1)	(VXED), x+4 < 15
	True. For all values OF x, x+4 <15.
	. Remark in grante for in companying
2)	(3x ED) : x+4 = 10 = / + x (C3 x E)
	True, there exists x = 6
1.5	Cara I're ar thai Game - D
3)	(Yx (D), x+4 510
	False
*	
4)	) (JXED), X+4 > 15
	False - And - Hundress - Keild
	2
	Ster Ster
#	at 2.0 0.000 (200)
	- It is a becond method of proof
	technique used in mathematics to establist
	the truth OF a statement For all
	integens greater than or equal to
	some starting point, typically denoted
	as 'n'. ' and and and a
	- It consists of two steps .
	1) Base Step
	- proof that the statement is

Date

wholes true for the smallest value n wually zero or one depending on the contest. @ Inductive step - Assume that the statement is true For an arbitary positive positive integer it's then using these assumption proof that it must also be true for k+1 Unit [8] 200 (198 a) - 0.5 (198 a) àq. show that in M.I N>,1  $1 + 2 + 3 + 4 + 5 + \dots + n = n(n+1)$ Let.  $P(n) = 1 + 2 + 3 + 4 + \dots + n = n (n+1)$ 1) Base Step. assume n=1 P(1) = 1 (1+1) Control of the in the dent of the little of PCID is true Triduitinge 18760 Induction Blep We must prove that K>1 PCK) is true a data tober of

DOWNLOADED FROM BATU-EXAMS.in Date Page 1+2+3+...+k = k (k+1) - 0also show p(K+1) is true  $\frac{1+2+3+\cdots+k+(k+1)}{2} = \frac{(k+1)((k+1)+1)}{2}$  $\frac{k(k+1)}{2} + \frac{(k+1)}{3} - \frac{(k+1)(k+2)}{2}$  $\frac{k(k+1) + 2(k+1)}{2} = \frac{(k+1)(k+2)}{2}$ (k+1)(k+2) (k+1)(k+2)2 2 LHG RHS Show that in MI N > 1 for  $1^2 + 2^2 + 3^2 + \dots + n^2 = n(n+1)(2n+1)$ 6 0. Let P(n) :  $1^2 + 2^2 + 3^2 + \cdots + n^2 =$ n (n+1) (2n+1) O Base Step assume n=1 P(1) = 1(1+1)(2+1) $\frac{1}{6} = (2)(3)$ <u>1 = 1</u>

DOWNLOADED FROM BATU-EXAMS.in @ Induction step We must prove that K>1. P(K) is true  $1^{2} + 2^{2} + 3^{2} + \dots + k^{2} = k(k+1)(2k+1) - 0$ We must prove For p(K+1) 12+22+32+---.+ k2+ (K+1)2= (K+1)(K+1+1) (2(K+1)+1) C  $\frac{k(k+1)(2k+1) + (k+1)^2 = (k+1)(k+2)(2k+3)}{6}$ . LHS = K (K+1) (2K+1)+( K+1)2  $= \frac{K(k+1)(2k+1) + 6(k+1)^2}{C}$  $= \frac{(k+1)}{6} \left[ k (2k+1) + 6 (k+1) \right]$  $\frac{2 + 1}{6} \left[ \frac{2 + 7 + 6}{7} \right]$ - K+1 [2K2 + 4K+ 3K+6]  $\frac{k+1}{6} \left[ 2k \left[ k+2 \right] + 3 \left[ k+2 \right] \right]$ 

DOWNLOADED FROM BATU-EXAMS.in Date \_\_\_\_\_ = <u>k+1</u> [(2k+3) (k+2)] = (k+1) (k+2) (2k+3)LHS = RHS . 9. show that in M.I n> 1 For  $1^{2} + 3^{2} + 5^{2} + \cdots + (2n-1)^{2} = n(2n+1)(2n-1)$ + Let. P(n) :  $1^2 + 3^2 + 5^2 + ... + (2n-1)^2 = n(2n+1)(2n-1)$ 3 () Base step. P(n) = n(2n+1)(2n-1)in static 1 & 3 the second P(1) = 1(2+1)(2-1)the states that I the course it is a the = <u>3 × 1</u> 3 1 = ) P(1) is true. @ Induction step We must prove that k > i  $1^{2} + 3^{2} + 5^{2} + \cdots + (2n-1)^{2} = n(2n+1)(2n-1)$ We have to prove P(K+1)

DOWNLOADED FROM BATU-EXAMS.in () line Page = ×+1 [(2K+3) (K+2)] = (K+1) (K+2) (2K+3) 6 LHS = RHS Q. show that in 17.7 nz 1 for  $\frac{1^{2} + 3^{2} + 6^{2} + \cdots + (n-1)^{2} = n(n+1)(n-1)}{3}$ Let .  $P(n): 1^2 + 3^2 + 5^2 + ... + (2n-1)^2 = n(2n+1)(2n-1)$ 3 1) Base step P(n) = n(2n+1)(2n-1)3 P(1) = 1(2+1)(2-1)3 CLEAN PRAILS = <u>3 × 1</u> <u>3</u> 1 2 ) P(1) is true. @ Induction step We must prove that k > 1  $1^{2} + 3^{2} + 5^{2} + \cdots + (2n-1)^{2} = n(2n+1)(2n-1)$ We have to prove P(K+1)

Date Page (2K-1)2 12+32+52 + .... + (2(k+1) -11)2 = (k+1) (2(k+1)+1) (2 (K+1) -1) 2 (2k+2-1)  $(2k+2)^{2}$   $(2k+1)^{2} = (k+1)(2k+3)(2k+1)$ an for an toat in 3 NA Schara -CI-GEY TIE  $k(2k+1)(2k-1) + (2k+1)^2 = (k+1)(2k+3)(2k+3)(2k+3)$ the United and a second second k (2k+1) (2k-1) + 3(2k+1)2 .(k+1)(2k+3)(2k+1) 3 4×10 sta8 化同常效 的复数制度 医一致的现象 LHS = K(2K+1) (2K-1) + 3(2K+1)2 = k(2k+1)(2k-1) + 3(4k2 + 4k+1) = K([2K]<sup>2</sup>-(1)<sup>2</sup>) + 3 (4K<sup>2</sup> + 4K + 1) = 24k3 - K2 + 3 (UK2 + UK+1) 3 = K2 (4K-1) + 3 (4K2+4K+1) 1 2 J. 1.15-14 = 4k3 - k2 + 12k2 + 12k + 3

$$\frac{(2K+1)}{3} \left[ k (2K-1) + 3(2K+1) \right] \\ \frac{(2K+1)}{3} \left[ 2K^2 - K + 36K + 3 \right] \\ \frac{(2K+1)}{3} \left[ 2K^2 + 5K + 3 \right] \\ \frac{(2K+1)}{3} \left[ 2K^2 + 6K - 1K + \frac{2K+1}{3} \right] \\ \frac{(2K+1)}{3} \left[ 2K^2 + 2K + 3K + 3 \right] \\ \frac{(2K+1)}{3} \left[ 2K((K+1) + 3((K+1)) \right] \\ \frac{(2K+1)}{3} \left[ (K+1)((2K+3)) \right] \\ \frac{(2K+1)}{3} \left[ (K+1)(2K+3) \right] \\ \frac{(2K$$

Date. Page

	By using principle OF MJ. prove that
	n(n <sup>2</sup> +5) is an integer multiple of 6 for
	all positive integer
1	+ Let p(n)
	$6n = n(n^2 + 5)$
	1) Basic step
L. 4	Let n=1
	$P(1) = 1(1^2 + 5)$
	6 = 1-(6)
	6 : 6
	P(1) is true.
	@ Induction step.
	We must show for k>1, PCK) is true
8.	6k: k(k2+5) -0
-	NOW,
	show For P(k+1)
	$P(k+1) = (k+1)((k+1)^2 + 5)$
	$= (K+1) (K^2 + 2K+1+5)$
	= K3 + 2K2 + K + 5K + K2 + 2K + 1+3
	= K3 +3K2 +3K + 5K +6
	= k3 +5K +3K2 + 3K +6
	= K (k2+5) + 3k2 + 3k +6
	$= 6k + 3(k^2 + k + 2)$
	P(k+1) is true
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# IF p belongs to (PEZ+) positive integer and P is greater than 1 is consider Prime if the only factor of P are 1 3 p otherwise the number is composite this means the number is composit iff 30 EZT. Such that opp and 1 is less than a is these than P(1 < Q < P)Fundamental theorem of Arithmatic. \* Every positive integer greater than 1 can be written uniquely as a prime OF the product of 2 where primes are written in non-decending order rock 1 randin

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DOWNLOADED FROM BATU-EXAMS.in Date\_\_\_\_ Page\_\_\_\_ n (hac) = 3x7 = 1000 21 = 48 N(BO(): 5×7 : 1000 = 23 35 <u>p(AABAC) - 1000</u> 3×5×7 ~ 10  $n(A \cup B \cup C) = n(A) + n(B) + n(C)$ n(AnB) - n(Anc) - n(BAC) + n(AABAC) = 333 + 200 + 142 - 66 - 48 - 29 + 10 : 542. (AUBUC)' = U- NIPUBUC) 2 1000 - 542 = 458 n(A) : 333 n(B) = 200 2 b(0) = 102

Unit - DOWNLOADED FROM BATU-EXAMS.in Date Page. Function . Function A Function (F) From A to B is an assignment of exactly one element of B to each element OF A where A & B are non-empty set Here A is called domain B is called co-domain and Domain and co-domain • - IF F is a function from A to ь then a is called domain & B is called co-domain Range . Range OF F is a set OF all image of element of A. r is subset of B Injenction (one to one Function) Injective . - A Function is called one to one Function if for all element a 3 b in A F(a) = F(p)a: b  $\forall a \forall b (f(a) = f(b) \longrightarrow a = b)$ 

OR (product operation of the second operation opera		DOWNLOADED FROM BATU-EXAMS.in
OR $(f(x)) = (f(x)) $		
$\forall \alpha \ \forall b \ (f(\alpha) \ = if(b) \rightarrow \alpha \ = b)$ $i \beta \alpha \ = if(\alpha) \ = $		
$f(x) = x^{2} + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + $		OR I ADDALL OPHINING
$f(x) = x^{2} + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + $		$\forall a \forall b (F(a) \neq F(b) \longrightarrow a \neq b)$
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$\frac{2}{(-2) \pm (2)} \qquad \frac{3}{4}  \text{adt}$ $\frac{(-2) \pm (2)}{F(-2) \pm (2)} \qquad \frac{3}{7}  \text{adt}$ $\frac{(-2) \pm (2)}{F(-2) \pm (2)} \qquad \frac{3}{7}  \text{adt}$ $\frac{F(-2) \pm F(2)}{7}  \frac{7}{7}  \frac{3}{7}  \frac{3}{7} $	1	0
$(-2) \neq (2)$ $(-2) \neq (2)$ $F(-2) = F(2)$ $f(x) = F(y)$ $(x + y) (x - y) = 0$		
$(-2) \neq (2)$ $f(-2) = f(2)$ $f(-2) = f(-2)$ $f(-2) = f(-$	Anda	
$f(-2) = f(2)$ $f(x) = f(y)$ $\frac{f(x) = f(y)}{x^2 - y^2} = 0$ $\frac{f(x+y)(x-y) = 0}{x+y = 0}$ $\frac{x+y = 0}{x = -y} = \frac{x-y = 0}{x = -y}$ $\frac{x+y = 0}{x = -y} = \frac{x-y = 0}{x = -y}$		0.
$f(x) = f(y)$ $x^{2} = y^{2}$ $x^{2} = y^{2}$ $(x+y)(x-y) = 0$ $x+y = 0$ $x-y = 0$ $x = y$ $x = y$ $x = y$ $x = y$		
$f(x) = f(y)$ $x^{2} = y^{2}$ $(x+y)(x-y) = 0$ $(x+y)(x-y) = 0$ $x+y = 0$ $x+y = 0$ $x-y = 0$ $x = y$ $x = y$ $x = y$ $x = y$		F(-2) = F(2)
$\frac{\chi^2 = \chi^2}{\chi^2 = 0}$ $\frac{\chi^2 - \chi^2 = 0}{(\chi + \chi) (\chi - \chi) = 0}$ $\chi + \chi = 0 \qquad \chi - \chi = 0$ $\chi = -\chi \qquad \chi = \chi$ $\chi = -\chi \qquad \chi = \chi$ $\chi = -\chi \qquad \chi = \chi$		
$\frac{1}{(x+y)(x-y)=0}$		F(x) = F(y)
(x+y) (x-y) = 0 x+y = 0 x-y = 0 x = -y x = y 		$\frac{1}{2} \frac{1}{2} \frac{1}$
x+y:0     x-y:0       x:-y     x:y		han 10 22-012 200 100 100
Result     Result       Result     Result       Image: State of the s	147	(x+y)(x-y) = 0
Result     Result       Result     Result       It is not one to one function		X-4 - 0
. 11 is not one to one function		
. 14 is not one to end		2 : - 4 3
		. It is not one to one function

DOWNLOADED FROM BATU-EXAMS.in Surjective Function 20 (on to Function ) div no every element by inca IF ડલ A corresponding element a in 9 ser Such that Â. FCa) = b such runction is called Surjective Function 6 10 The OF Surjective Function range is same as co- domain 12 115 6 23 3 Bijective 62-17-Function P CY Function is Bijective if A contain both it one to one Onto Function (1/1) and " H- x 107 H 12 11 30 Mail 9665 01 399 100 81 11

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A	
Q.	F(2) = 122 + 311 - 200 - 1 - 20 - (1) - 0
	Domain - {1,2,1/2 } = = = = = =
	(0. domain - 1 5.7.4)
	- AOPT1237 - 22 AD
	F(1) = 2(1) + 3
	: 2+3 (1: / Arc
	F(1) = 5
	1.9 2 37
	f(2): 2×2+3 1/2
	: 4+3
	7
	$f(1/2) = 2 \times 1/2 + 3$
	= 1+3
	2 LA 12 LA
Q.	f(x) = 3x - 2 Determine the type of
1	aprifunction/and ant ad a 1 tal
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	O one to one Function
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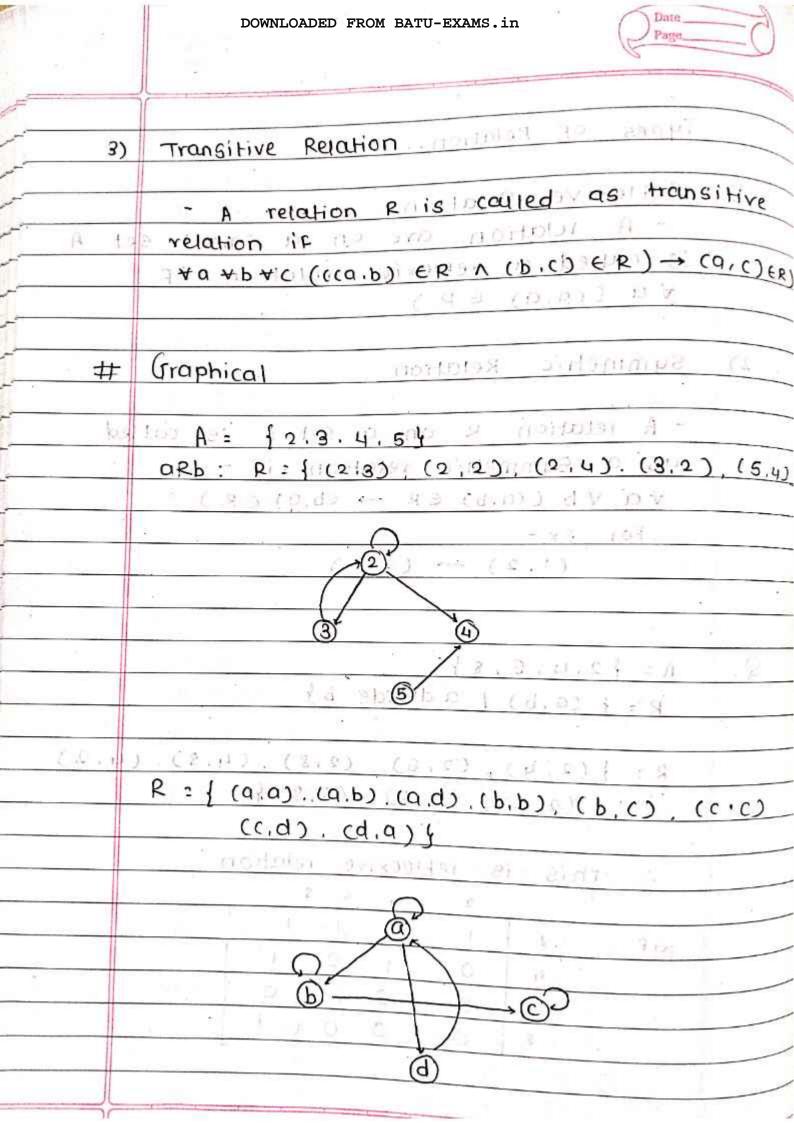
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F(2) = 2x+1 Prove that it is Q. on to Function ..... turces intomotion On to Function f(x) = 4 S = (0) 22+1 = 4 2 - da S ( 1-4 : 20 x = 4-1 2 E- 3×0 : (2)7 1 E t 12 D 1  $f(\frac{y-1}{2}) = 2(\frac{y-1}{2}) + 1$ = <u>9-14</u>96 = 6800 ÷. = Y 10. C Inverse OF a Function # Let F be the Function from A to B with a Bijection then  $F^{-1}$ :  $B \rightarrow A$  which associates each element b belongs to set B to a diffrent element a belongs to set A. such that F(a) = b then F-1 (b) = Q P. X antiquet and of any el transition

DOWNLOADED FROM BATU-EXAMS.in Relation A Relation Or binary relation are from set A to set B is a subset OF A×B which can be defines as arb R (a. b) arb R(a,b)(d.e) A= {1,2,3,4,5,64 ..... R = { (a,b) | a divides b } a = { 1, 2, 3, 4, 5, 6 } b= \$1,2,3,4,5,6} 2-76.0) 4 7 ·20)  $A \times A = \{ (1,1), (1,2), (1,3), (1,4), (1,5) \}$ (1.6) . . . . . . . (6.6) { 100  $R = \{ (1,1), (1,2), (1,3), (1,4), (1,5) \}$ (1,6), (2,2), (2,4), (2.6), (3,3)(3,6), (4,4), (5,5), (6,6)DC: d YO. 14. R S A×A d == 7 . E4 6 16 12.27 (8.2 . 12 C. 10. 20 13

DOWNLOADED FROM BATU-EXAMS.in Date Page (ac-1) 193 a R b R (a,b) co monte(12) A : 1 11, 2, 3, 43 A tad mon B: 19, b. C}  $R = \{ (1,q), (1,b), (2,C), (3,q) \}$ CHLOT A L J MOL 20 R = { (a.b) | (a.b) # R} 130  $R = \{ (1,c), (2, q), (2,b), (3,b), (3,c) \}$ (4, a) (4, b) (4, c) 4P. H. Children M. C. Children H. H. S.  $R' = \{ (b, q) \mid (q, b) \in R \}$ 10 8 0 8 9 14 R' : ş (a,1), (b,1), (c,2), (a,3) (4,1) 2.183 10.11 × 1 + 1 + 1 GRB (R (Q,b) . 1 8 . A: {2.4.6.3} CE.F 2,31 (2.8) (1.0) (3.8) ( (a, b) / a= b+1 R = or b= 2a f A. A. D 3 9 9: 2 . 4 . 6 . 3 3 b= { 2, 4, 6.34  $R = \{ (3,2), (4,3), (2,4), (3,6) \}$ 2 4 6 3 MR 2 : 0 L 0 0 0 4 0 0 1 6 0 0 0 0 1 3 0 1 0

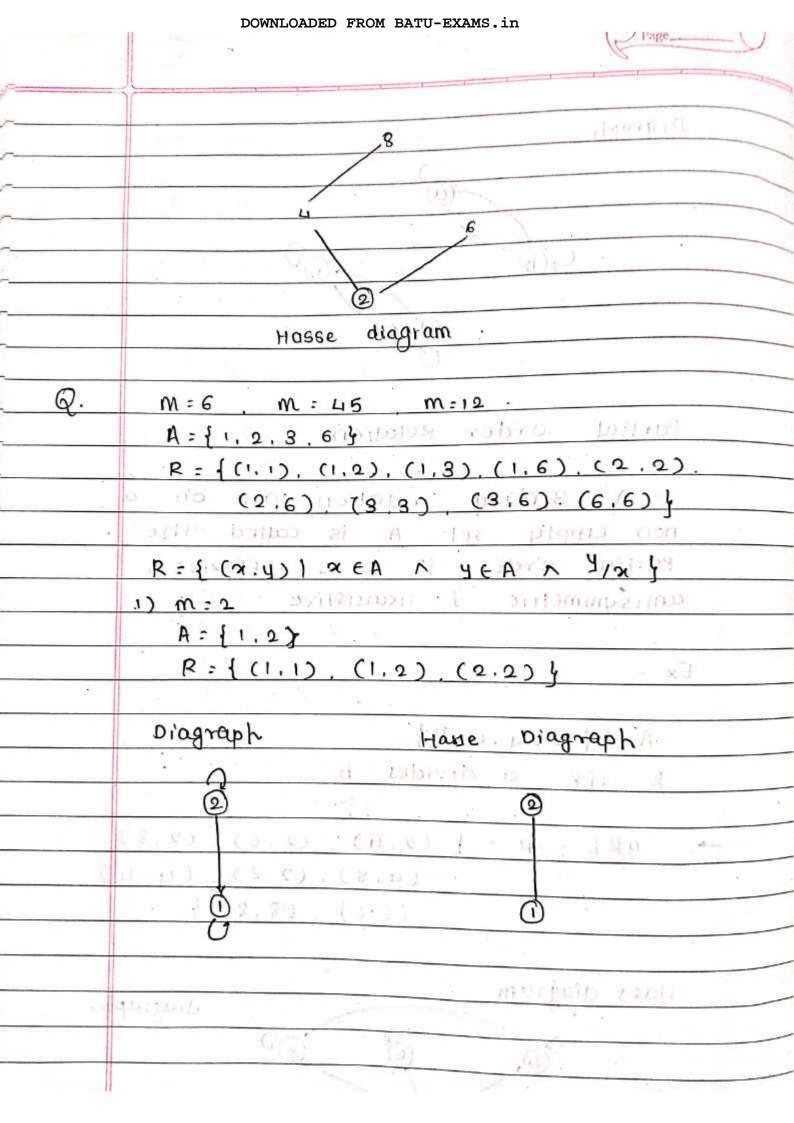
DOWNLOADED FROM BATU-EXAMS.in Date Page Types of Relation . 10 1019 2 241 2021 (201 DE REFIEXIVEDERELATIONAL MONTONIA - A relation are on a small set A is called a reflexive relation if Va ((9.0) ER) 2) symmetric Relation indiatal the - A relation R on a set A is called as a symmetric relation if - 150 2)  $\forall a \forall b ((a,b) \in R \rightarrow (b,a) \in R)$ For ex- $(1,2) \rightarrow (2,1)$ 18 A= {2.4.6.8} Q. R = 1 (a,b) 1 a divide b} R: {(2.4), (2.6), (2.8), (4.8), (4.4) (2.2), (6.6), (8.8) 1 ( p. by ( p. 1) ... This is reflective relation 4 6 8 2 1 1. 1 31 2 MR = 81 1 0 0 4 0 1 0 0 - 6 / 0 1 0 0 8 0 6



DOWNLOADED FROM BATU-EXAMS.in Date Page Q actions conductions 6 3 T 65.00.0 And Oak at →@J 6 -(1.1) (d. d.) (0.0) · manualized 7  $P = \{(2,2), (4,4), (1,2), (5,1), (5,4)\}$ A = { 1, 2, 3, 4 } Q B = {1.4.6.8.9} arb iff (b= a2 a a a company) (d. d) - (d a) A (r, d)  $R = \{ (2, 4) \leftarrow (1, 1), (3, 9) \} ()$ Domain = {2,1,3} Range = 2 (4, 11, 9), 1) 1 (1,0) (1.0) -1 14, 66.8 9 MR 26, 10 - 16606 01 010 0,10,00,00,0 7.1.12 0 0 0 0 1 n 3 13 3 1 - 4 0 0 0 0 0 10 - 12 - <sup>12</sup> CH (8  $\odot$ Digraph -3 3 (2)9 (4

DOWNLOADED FROM BATU-EXAMS.in Dute Page Equivalence Relation A = { a , b , c 4 R= { (q,q), (b,q), (b,b), (c,c), (d,d), (q,b) ((.d),(d,c) } G.W\* ① ReFlexive - (a,a), (b,b), (c,c), (d,d)  $[\pi]$ (LATI, (CILLICOR), CLEFF, A @ symmetric - $(b,a) \rightarrow (a,b)$ ,  $(c,d) \rightarrow (d,c)$ 14 East to A I Transitive - $(a, a) \land (a, b) \longrightarrow (a, b)$  $(b,a) \land (a,b) \rightarrow (b,b)$  $(b,b) \land (b,a) \rightarrow (b,a)$  $(c,c) \land (c,d) \rightarrow (c,d)$  $(a,b) \land (b,a) \rightarrow (a,a)$  $(a,b) \land (b,b) \rightarrow (a,b)$  $(c,d) \land (d,d) \rightarrow (c,d)$  $(c,d) \land (d,c) \rightarrow (c,c)$  $(d,d) \land (d,c) \rightarrow (d,c)$ G 9 .: E c u d MR = 9 1 0 11 ١ 2.3 ъ 0 duesd a 0 0 0 1 1 d 0 0 1 1 170

Page\_\_\_\_\_ DOWNLOADED FROM BATU-EXAMS.in Digraph. ි 00 GG  $\bigcirc$ Altern Basis Ma Star Partial order relation CR. 23 (ALLA CR. D. CR. A) CH. 61, CR. 23 - A Binary relation are on a non empty set A is called the Partial order if R is reflexive, antisymmetric & transistive A = 1 1 . 2 . 1 Ex - (10,00) (00,10) (100) - 8 A 44 (12:44, 6:18:3 400000 p iff a divides b  $QRB: R = \{ (2, 1), (2, 6), (2, 8) \}$ (4,8), (2,2), (4,U) (6,6), (8,8) 4 Hass diagram. diagraph (C) CB,



DOWNLOADED FROM BATU-EXAMS.in Date Pager m : 6 2) A={1,2,3,6} , moreow seen  $R : \{ (1, i), (1, 2), (1, 3), (1, 6), (2, 2) \}$ (2,6), (3,3), (3,6), (6,6)Diagraph Hasse diagram 6 Q <u>(</u> (B) G 0 :31  $(\mathbf{i})$ 3 1 91.3.14.9... (3.1), (1.2), (1.3), (1.4), (1.5) 1.11.10 m: 45:(, e) (3, e) (p. 2) (e, e) 3) A: { 1.3.5.9.15.45 }  $R = \{ (1,1), (1,3), (1,5), (1,9), (1,15), (1,45) \}$ (3,3), (3,9), (3,15), (3,45), (5,5),(5.15), (5.45), (9.45), (9.9)  $(45, 45), (15, 15), (15, 45) \}$ - dampoin Diagraph 45 3 (15) Ø T

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P	70.8	, Q ,	$\{-\} \in A$	
6.12.13	0.00.10 (5) (0.11)	(1,1)	1 = 9	
	(2.22. (.2) (J.2)	3,0)		
	Ø			
	mar poils and H	1190	Diagra	
1	3 6	10		
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100 m	C C	1	1	
Contraction of the	- B - G	j l	(2)	)
	m = 12		1	A
	A= 11.2, 8, 4, 6, 12 }	. (D)	0	
	$R = \{ (1,1), (1,2), (1,3), (1,3) \}$	1.4),	(1.5),	(1,12)
	(2,2), (2.4), (2,6),			18
2	(3.3), (3.6), (3.12)	9., 8., t	} : A	+
23.19. 62	.10 ((4.4) ((4.12) 8.1)			
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	i) How many of them are not anysible?
_	nor by 5 nor by 7 ?
	*
	6
6	
	-0°
	1 318.344 . 36 . 34 . 04 . 3 4 . 4
	(1, CE, 3), (1, 2), (01, 8), (2,8)
	1 (212,312) (38,28) (38,28)
18	
G.	Given two sets
	A= 11.2.3.4.54 . B= 13.4.5.6.73
	Then find
	O AUB RD.
	AUB = 13,4,54
	- (c) (c)
	④ А-в
	→ A-B= 1,2 4
Q.	IF A: 11.2, 3.4.5} "B: (a.b.c)
	Find AxB
-	$\rightarrow A \times B := \{(1, q), (1, b), (1, c)\}$
	(30), $(2.0)$ ,
4	(4,0) $(3,0)$
	(5, q), (4, b), (4, ()) (5, q), (5, b), (5, ())
	(5.0). (5.())

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1047	Let p Jog hober the proposition
1	P: Swimming 11 at New Jersey shore
	is allowed approved and a participant
	q: Sharks have been spotted near
	the shore
	(.V.) antifacult teatavial m
1-55	i) (NO (DI) V (DUMDE W/T
-	sharks have been not spotted
- 1	malot i near sushore base of Film
	that chippies to every clement in
	ii) ap niomola in 192 novin 90 .
	Swimming at New Jersey shore
	is not allowed.
	- Y X P(3) means Far all &
	iii) $P \rightarrow \sqrt{q}$ . spit 21 cm?
-	+ IF Swimming at New Jersey shore
	is allowed then sharks have been
	noite spotted near shore and
	a synt
	iv) NP V9
-	-> Swimming and New Jersey -shore
	is not allowed on sharks have been
	spotted near the shore
	netions in salary of beech at the
	13 Januar 11, 11, 11, 12, 11, 12, 11, 12, 12, 12,
	ent toom toom to the set
	ALL ADDING USAR D. CURANTON IS IN
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	Explain Universal quantifier & Existen. tial quantifier with example What is permorgans law For Quantifiers ? Universal Quantifier (V) — The Symbol V (For all) represent a Universal Quantifier — It is used to make a statement
31417 2	that applies to every element in a given set or domain and usered with the parameters for e.g. becastly ion at - V x P(x) means for all x
	P(x) is true. por equilibrium of the equilibrium o
a ro nasd	(2) Existential Quantifier (3) The Symbol 3 (there exists) represents an Existential Quantifier - It is used to make a statement that asserts the existance of at least one element in a set for which a given condition is true

Ш

_	(	1
	For De.go. Lal ant indiana shimistan	5
11		
1 11	x such that Q(x) is true	
Ø u	A= 101, 2. 3. 101, 5 40 p g	
	T(Ex (A), x+2 = 5 7	
	True, there exists x:3	
	1 7 7 7 7	
	Demorgon's Law For Quantifier.	
	( TO A ROLE UPER) ~ V & EU (TOP(x))	
Q.	Given A= 11,2:3,43 \$ B= (x.y.z	3
	let R be the following relation	G
	From A to B	
	$R = \{ (1, y), (1, z), (3, y), (4, x), (4, x) \}$	2)}
	8	
~)	Determine the Matrix OF relation	1
	z x y z	
	<u>MP 27 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 </u>	
	and an interest of an	
(")	Find converse of (7.1) (4.3) (2.4	),
	$\rightarrow R^{-1} = \{ (Y,1), (Z,1), (Y,3) \}$	
	(2.4) 4	

Determine whether the following Proportion is contradicton or tautology a Give when there early or (PVQ) A (PVNQ) A (NPVNQ) A (NPVNQ) 9 NP NG PVQ PVNQ P T B F S - F CATI S IT Т SES FROM TARALE T SHIT & T Т T T F T F F FUTURES TT UTIL SUFERING T (PVQ) ~ (PVVQ) (NPV NQ) (NPV NQ) T F Friday T & Friday Titye NOTOFIC UNDERLOY TONE AND AT FIL F TEL OI D TRANS . (M. D. (P.E. (JSI) (V.D. F. 9) 17190 B (NPV9) A (NPVN9) A A ABUNDO F 1 F F Т F 2,01 Т F The proposition is contradiction . 0.3950135 arrayna brit Cu

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P	V	9	V	P	
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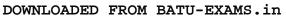
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			1.9	а. С. 1		_	
	PV	1 ~ q					
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	1	F			<u>a</u>	TV T	т <u>-</u> Т
	Т	г		е. 		TVT	F : F
	5						
	Cher	ck	wheth	er th	ne re	<u>latio</u>	on R defined
/	in	th	ne set	<u>د ا</u>	. 9. 9.	4.5	5.6 y is
	R	= +(	(Q,b)	: b: 0	a+1 4	. is	s reflexive,
	Syn	nmet	rtic or	r tran	sitive	· Ju	whity your
	an	swen	r Find	t rela	ution	· Ma	Uttlx . 5=9+1
*							
	R	: {	(q.b)	: b:	Q+1 [	1	(2,3) (1,3) (2,3)
			2				(2,3)
	R	2 1	(1.2)	. (2.	3).	(3.4	1), (4.5), (5.6) }
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	( - (	0,6/	$/\Lambda(b)$	$c) \rightarrow$	(0)	1	Mark Start Start Start Start Start

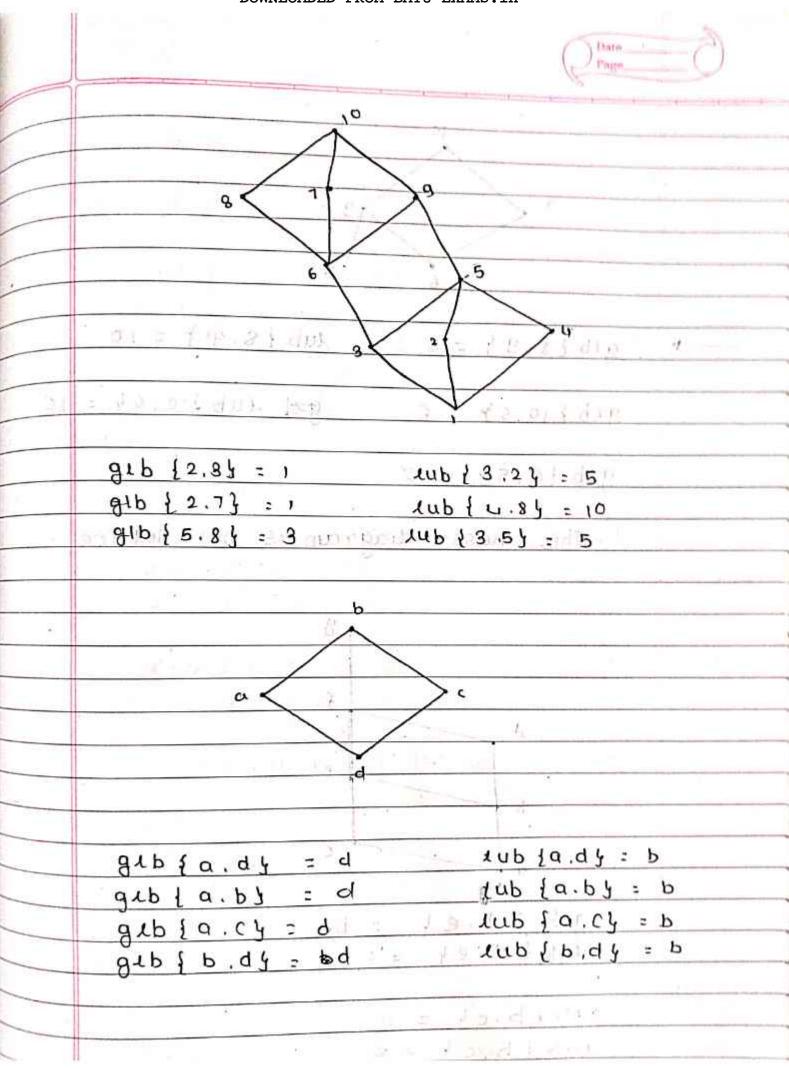


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Lattice . # d Maximal e с minimal upper bound fa. F3 - b.c.e.d (10b) least upper bound (a.F} - b Lower bound faits = q. greatest Lower bound (glb) - ø ub - {c,e} = d lub ( c. e } = d 1b - 1 c. e3 = b. a. F glb - f cie} = ub - 16, dy = шь - { b. d} =



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DOWNLOADED FROM BATU-EXAMS.in Date \_\_\_\_\_ h 9 SALE COL 1 71 ai oridatement 90 . . 10 solutionee of elenie 4 e sunt and at (1 - (20, 10) - 10 B as which of avour the judmin and to sonaripad batabio n distinct element in ballos Ta entre a time and colled in Permutation 09 m elements g1b { b, c} = a lub {b. c. == 9,0" 10 (7.0)9 ( n - n ) geb (F.g) = e,b. 146 {F,gy = h + 2; 4.0}=0 n 5110-10201139 4 geb {b, e} = a do do lub { b, e} = F, do , no , nd . This is not a lattice . . . . . . (5-8) JX2XL A 8

to Page

1 1 - Permutation is an arrangement of sequence of elements of a set ... It has three types . 1) tate let, 05 r 5 n Type the number of ways to have an ordered bequence of n distinct element taken r at a time is called r Permutation OF ~ elements a paid dip P(n.r) or "pr R== n! . d } dus. (n -r) ! d 3 = (8,11 dan S= { a.b. c } d = 2 8.72 duy 2 permutation ab, ac. bc, a to did dip ba, ca, cb, 1 2 / 2 . d . d . d . . This is not a (Euline - (c, c) 9 (3-2)! - 3x2x1 = 6

Date 4 person enter a bus in which there are 6 vacant seats in how many whys can. they take their place an and torap(6.4) and burda available of n = 6 \* + 60 \*----Y:4 -5 7 6 P(6,4) or "P4" = 6! (6-4) (6-4) 1 × × × 5 × 4 × 3 × 2 × 1 1×5×5×1×7 2! - 6×5×4×3×2×x XXX = 30 × 12 dation at avour 236.0 and MT (3) - wait bearing ad and lasmala a sat 30 Q. Find a permutation of a set A = { 1,2,3,4 Taking the elements two at an time to starting on the normal bar plum of Yes/2 mini tel bas milone P(4,2) = 4!(4-2)1,739 21 4×3×2×1 2×1 = 12

Date Page Q. Find how many words of length 3 can be Formar From the word ? (2.0)COMPUTER. The beginning letter must be c & there should be no repeatation. n = 7 0 = 0 ptor Y:2 P(7.2) == 7,192 - (4,3)9 (1-2) (7-2) 1× 4× 5×4×3×2×1 5×4×3×2×1 KARABAH ARBON 1.532 21×08 2 The not of ways in which Type of the n element can be arranged e.c. ) where ~, element dremor themione .? kind in element are of another kind and so on till rk elements of another kind is Given by Formula 14 . (2.4) 9 P(n,r)a-ii) r, ! : Y2 later rkc! 125 26 1 2 1

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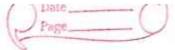
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Q.	In How many ways the letters in
9	a word MISSISSIPPI can be amanged.
	+ 10 MISSISSIPPI 10 Manut odt
	, rping = shit o to are togosis
ł	when reach otement may be replace
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replaces can be filled up hr         Q       A die is rolled 3 times find         the No of faces that appears         On top $\bullet$ 6×6×6         T = 6         n' = 6 <sup>3</sup> Q       Find the No. of binary sequence         of length 5         T = 5         n = 2		once twice are time in any arrange -
Q       A die       ight molled       g times       Find         the No. OF       Faces       that appears         on       top       top $\rightarrow$ $6 \times 6 \times 6$ top $n = 6$ $n = 6$ top $n' = 6^3$ $n' = 6^3$ top $\rho$ Find       the No. of binary       Sequence $of$ length 5 $ 1$ $0$ $     n = 2$ $n = 2$ $n = 2$ $n = 2$		
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$2 \times 2 \times$		
$n = 6$ $n' = 6^{3}$ $Q  Find  the  No.  6F  binary  Sequence$ $oF  length  5$ $$ $r = 5$ $n = 2$		
$D' = 6^{3} de$ $Q  Find  the  No.  \delta F  binary  Sequence$ $oF  length  5$ $$ $r = 5$ $h = 2$		
Q Find the No. of binary sequence of length 5 		
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$ \xrightarrow{\text{reng} + 5} $	Q	
 r:5 n:2		of length 5
n = 2		1 0
n = 2		
		Υ : 5
<u>n<sup>1</sup> : 2<sup>5</sup></u>		
		n <sup>1</sup> : 2 <sup>5</sup>

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2	Combination of Canada and a contract of the
$\square$	- Let ozrzn
_	A selection of set r element are
_	from a bet of n distinct element is
_	called combinations.
	L CE-EVIE
	C(n,r) = n!
	r r (nar) ; sad
	(0)!F IF 18 181 101
	e.g.
	Υ = 2
	dulo n'is 3 redonent ante are a bao a Q
10.44	the club has membership of 30.
d	334: Ci(n.r) n = 10 31 avour unont light nt
	2! (3-2)! (3-11)
	in <u>pabriax2×184</u> (mm A ci 2×1× (1) ( 29) (mmo)
	ion chais. 20001201 3thoras ro 1 0
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Q.	the the production
	at at hatch (an account
	The second 8 and the s third by 7
	1/1-1/2
	- <u>n = 15</u>
	(25.10) 100 9/10 B
	C(15,8) C(7,17) C C C C C C C C C C C C C C C C C C C

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	((25.10) × ((15.8) × ((7.7))
~	
~	$= \begin{bmatrix} 25! \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $
14.17	10! (25.10)! L 8! (15-8)! ]
~	Print o su al print alland and and a complete combination of the combined and the combined
	2 25! × 15! × 7!
	10! 151 81 7! 7! (0)!
-	8.5
	$\mathcal{L} \neq \gamma$
Q	A and B are the member FOF club
	the club has membership OF 30. of 10
	In how many ways can a committee be
	Formed · ((C-E))
	i) A must be included in a
	1 Committee - (1) × 1× C
	ii) A or B should included but not
	both
	In how many ways can as let entry
39 A	Gigalitation to three second to three indexes
21030010	a b(b(29.9) and dated 1213 adt 41
12	pa budt 291 arit bab & babase silt
	9! (29-9) ! er an 4
	= 29! (al. 2010
	9! × 20! 7 3 5 3
	= 29 × 28 × 21 × 26 × 25 × 2/4 × 23 × 2/2 × 2/1 × 20
	×××7×6×××3×4×××1×201

DOWNLOADED FROM BATU-EXAMS.in Date Page = 29 × 7 × 3 × 26 × 5 × 3 × 23 × 11 × 8 Sequence OF (Second in Noted in a 1007 - 1203 × 178 × 15 × 253 paper appear and even numbers of time in which s opporter exciting twice CI THE DEDIGED OF DOG OF EXACTLY IS -Hines ii) 164 177 - A is included earner or ((28,9) B & (0.0)) - B is included as mit as ca ((28,9) 13 ((2,8)) ) = ((28,9) + ((28,9)) + (8)28(0.2)3 Ξ "" ROMH & CH 28 - (9.700 + [+ 2 × COLDINT - FPP × (0.2) )] [ \*axcolog x [ \*a v (a, a) of - 3 1 (5-2) 16 1 1 2 7

DOWNLOADED FROM BATU-EXAMS.in Q A die is rolled 6 times & Q Sequence OF Faces is noted in How many sequences does the face 5 appear and even numbers of time also find the number of sequences in which 5 appears exactly twice or the face 3 appear exactly 4 times . i) O times habulani ei A - $\bigcirc$ ((6.0) × 56 (P.20)) 2) 2 times babuloni zi 8-. ((6,2) × 54 (0,20) 3) 4 times  $\rightarrow (2.24)$  >  $\rightarrow c(6.4) \times 5^{2}$ 4) 6 times C(6,6) × 5°  $[((6,0) \times 5^{6}] + [((6,2) \times 5^{4}] +$  $\frac{\Gamma((6,4) \times 5^2] \times \Gamma((6,4) \times 5^2]}{\Gamma((6,4) \times 5^2]}$  $= \begin{bmatrix} 6! \\ x 5^{6} \end{bmatrix} + \begin{bmatrix} 6! \\ 2! (6-2)! \\ 2! (6-2)! \end{bmatrix}$  $6! (6-6)! \times 5^{\circ}$ 

DOWNLOADED FROM BATU-EXAMS.in ) thate \_\_\_\_\_  $= \begin{bmatrix} 6! \\ 1 & 5^{6} \end{bmatrix} + \begin{bmatrix} 6! \\ 2! \times 4! \end{bmatrix}$ 1 × 5 6 ] 4 [ 6× 5× 4/ × 54] +  $\begin{bmatrix} 6 \times 5 \times 4! \times 5^2 \end{bmatrix} + \begin{bmatrix} 1 \times 1 \end{bmatrix}$ A dependent of take set of sectors () nd 11: [15625] + [15×1625] + [15×25] house in dring of redably -4 = 15625 + 9375 + 375 + 10 = 25376 8 .... 2.0 pp  $((6,2) \times 5^{4} + ((6,4) \times 5^{2}) - ((6,2))$  $= 6! \times 54 + 6! \times 5^{2} - 6!$   $= 2! (6-2)! \qquad 4! (6-4)! \qquad 2! (6-2)!$ 2×1×4! ×54 + 6×5×4(×52 6×5×4) 2×1×4! ×2! 2×1×4 2×1×41 = [15×54]+[15×52] - [15] = [ 9375] + [ 375] - 15 aleal with war-hat the loss fit diar = 9750 - 15 - 9735

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T	Discrete Numeric Function
	1. S. S. L. 1. 1. 1. 3. 1. 1.
ବ ବ.	A ping pong ball is droped to the
	Floor From a height of 20 m.
-1	suppose at the ball always rebounds
	to reach half of the height which
	it fails then Find
0	determine the Numeric Function A
1.2 0 1	where A are is height of the ball
-	reaches in earth rebound.
	Ao +=226 + 21 58 + 2220
	9, 210
-	92 : 5 DYKAS :
	Q3 : 2.5
64	652 Q4 - 2x1.251 ) + P2x(20) ) 6
Ť	
	-fax: 10 - 10 - 10 - 1
e-jaŭ l	a = { ao, a, a2, a3, a4 y
N S X L	
0.8125	- 12 x 12 1 1 x 1 x x
	$a_r = 120$ , $r = 0$
	[a] J ( QTH BI, TY SONAL )
	` <u>2</u>
	31- FATE I - LATER
0	If we are denotes the loss of
	in height during the earth rebound

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	(*************************************	
then express by interms	po Forq Mil)	· 16-
+ br = $ao - ar$	0	
bo = O = . fix , 'x	25 4 4 2	
b, = 10		
b2 = 15	o D) ≥ D	
b3 : 17.5		
- + * bu ~ "18:75 '. D + " 500	\$ = (5)A	
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		4
(s)A	Marmule	
Ramesh deposit 200 Rs in so	iving acc	
	A	0
the interest rate of gy.	per yea	h 11-0
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compounded annualy Ifman	denotes	the
compounded annualy Ifman amount in account after	denotes	the letermine
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compounded annualy Ifman amount in account after the Hymeric Function way	r years d	the D letermine
compounded annualy Ifman amount in account after the Nymeric Function way	r years d	the D letermine
compounded annualy If ar amount in account after the Numeric Function way $A = P \left(1 + \frac{2}{100}\right)^{n}$	r years d	the D letermine
compounded annualy If ar amount in account after the numeric function way $A = P \left( 1 + \frac{2}{100} \right)^{T}$	r years d	the D letermine
compounded annualy If 1971 amount in account after the Nymeric Function way $A = P \left(1 + \frac{2}{100}\right)^{r}$	rdenotes r years d	the D letermine
compounded annualy If $Ar$ amount in account after the Nymeric Function way $A = P \left(1 + \frac{1}{100}\right)^{r}$	r denotes r years d	the 1
$\frac{\text{compounded annualy If } ar}{\text{amount in account after}}$ $\frac{\text{the Nymeric Function way}}{A = P\left(1 + \frac{2}{100}\right)^{n}$ $\frac{A = P\left(1 + \frac{2}{100}\right)^{n}$ $\frac{A = 200 \left(1 + \frac{9}{100}\right)^{r}$	r denotes r years d	the D letermine
$\frac{\text{compounded annualy If } ar}{\text{amount in account after}}$ $\frac{\text{the Nymeric Function way}}{A = P\left(1 + \frac{2}{100}\right)^{n}$ $\frac{A = P\left(1 + \frac{2}{100}\right)^{n}$ $\frac{A = 200 \left(1 + \frac{9}{100}\right)^{n}$ $\frac{A = 200 \left(1 + \frac{9}{100}\right)^{n}$	r denotes r years d	the 1
compounded annualy If $Ar$ amount in account after the numeric function way $A = P \left(1 + \frac{2}{100}\right)^{r}$	r denotes r years d	the 1

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\* N- and s id Z= { 2°, z', z2, z3 } 0 0 00 01 = 10 a: {a, a, a, a, a, ....} 574 : 18V  $A(z) = \{ Q_0 z^0 + Q_1 z' + Q_2 z^2 + Q_3 z^3 + \dots \}$ A(2) Numeric have there function when it as able theorem is much rook was the fo other tearstin one Ont az = constant - ulouno, buconstant suite l'égenq : (10,1,11; 12,) fautenne ai f(1-72) , pow. applant prismpts add E az = r e.g. Q= (0,1,2:3) + + 1 y = A(1-2)2  $a_{\xi} = b_{\xi} \cdot a_{\xi}^{\gamma} - \frac{b_{\xi}}{2}$ 3 abz  $(1 - 92)^2$ - · · ( RO-0 + 1) . 000 az = k.a" 4 K (10-1) 000 - 10. 1-92 <u>|</u> <u>~</u>] € Q = : ez

azeti= 3t + 4th manner 1 no Aczonie ? no et rant province anist and all and internet the net by a star son is and O . Or to ultimon Maginge and ac 50 5 A 213 PSTAL 112 8 29 1-0 ----18(2) = 410490 non 21 50 sigia 1-32  $\frac{(10_{1}) + (11_{1}) + (10_{1}) + (10_{1}) + (10_{1})}{((2) + (1)_{1}) + (10_{1}) + (10_{1})}$ = 4 - 4 = 100 3 = ±4.0 b o = 0 1.00 1947 1-42 +11-+0 - bag A(z) = B(z) + c(z) - c(z) -1780 1 (1-42) + 4 (1-32) (1-32) (1-42) 2 040000 = 1-42+4-122 (1-32) (1-42) 1= 103 5 - 162 -(1-32) (1-02)

Date Page.

Recurrence Relation - A recurrence relation of the sequence any is an equation on that expresses an in the terms of One or more of the previous term of the sequence namely ao, a, a, a2. .... an-, for all integers n>/ no non negative integer. where no is 1 - 87Cody + C, Q1-1 + C2 Q1-2 + ... + CKQ1-K z f(x) 1 ( (2))  $\sum_{i=0}^{k} c_i \alpha_{r-i} = F'(r)^{j}$ Co to f CK to ... Kth order Sti-Fa 2nd - order (0 ar + (, ar-1 + C2 ar-2)A 3rd order Coar + C2ar-1 + C2ar-2 + C3ar-3 Total = 1 ) 12 + (sp -1) 1  $Q_r = Q_r^{(h)} + Q_r^{(P)}$  $-1 \int (-1) + 5 (1 - 1)$ Perficular Homogeneous 1  $F(r) \neq 0$ F(r) = 0Lan-13 812-13

DOWNLOADED FROM BATU-EXAMS.in Date CoQr + C,Qr-1 + C2Q1-2 = 0-108 + 10 .0 E A E Auxillary eqn. 0: ) + ma + m Com2 + CIM + C2 = One - ne . Em D = (C + (T) + (C + (T))) m CASE I : Roots are real & equal  $\mathbf{m}_1 = \mathbf{2}$   $\mathcal{E}_{--} = \mathbf{c} - \mathbf{c} \cdot \mathbf{m}$ m2 = 2 A. .) m. = m2(Ms) + (m,) = r0. (19-) 02 + ((-),) + General Goln =  $Q_1 = (c_1 + rc_2) m^2$ CASE I : Roots are real soun equal 3 m, = 2 ..... M223 8000  $m_1 \neq m_2$ General Soln = 3 A  $\mathbf{q}_{\mathbf{r}} = (\mathbf{r} \mathbf{m}^{\mathbf{r}} + \mathbf{C}_{\mathbf{n}} \mathbf{m}^{\mathbf{r}} \mathbf{m}^{\mathbf{r}} + \mathbf{C}_{\mathbf{n}} \mathbf{m}^{\mathbf{r}} \mathbf{m}^{\mathbf{r}}$ 0 : P+(12! - ~m CAGE IL : Roots are Complex 1. Imaginary 0 = (8-11) (- (8-11)11  $m = \alpha \pm i\beta \circ \alpha (1-m) \circ n-m$ 1. P: m  $a_1 = (c, \cos r \Theta + c_2 \sin r \Theta) R'$ 2.9  $R = \int \alpha^2 + \beta^2 + m = 1$  $\theta = \tan^{-1} \left( \frac{B}{A} \right).$ 

DOWNLOADED FROM BATU-EXAMS.in Q. Qr + 50r-1 + 60 -2 = 0 10 + 1000 \* A · E  $m^2 + 5m + 6 = 0$  mps (2011) 201  $m^2 + 2m + 3m^2 + 6 = 0 + (1 + 2 + 3 + 2 = 2)$ m(m+2) + 3(m+2) = 010000(m+2)(m+3) = 0 =1009 . 1 1840 GS D is all ar = C. m" + Cem", m = ...  $= (, (-2)^{r} + (2(-3)^{r})^{r}$ General'solt = 90 = (c. + xcz) mt. CNEE IL L' ROCO = COLLADERH , HODOR - LADI Q Given . -9 = , 01 Q0 = 3 E 4 100 a, = 11 s河中; m : aloe intenen A.E  $m^2 - 10m + 9ma = 0m = 10$ m2-10m+9 = 0 Urphike mi m2 9 m - m + 9 = 0 + 003 - - 9 = 1/10 m(m-g) - 1(m-g) = 033 (m-g) (m-1) = 0 git > = m m=9,1 (a ( a r nie c) + ( a r eo) ...) = no G.S.  $Q_r = (1 m^r + C_2 m^r)$  $Q_1 = (1 (Q)^1 + (2 (1))) \longrightarrow \textcircled{}$  $\theta = \pm \alpha n^{-1} \left( \frac{\beta}{2} \right)$ 

DOWNLOADED FROM BATU-EXAMS.in  $q_0 = (1 (g)^0 + (2 (i)^0 + 102 - i^0)$  $3 = C_1 + C_2 \qquad \qquad \exists t \in \mathbb{R}^2$ (1 + (2 = 3) - 0) = 2 + 10 $C_1 = 3 - C_2 - 2$ 7 A  $a_1 = (, (g)' + (2(1)') = m$ 9C1 + C2 = 011 (0 - 3) (0 m) of the min ( and) Put eqn @ in @ p. p. cm 9(3-(2)+(2-1))27 - 9(2 + C2 = 11 (m) .) = 10 -9(2+ (21 = 11-27) - 1) -8(2 = -16 8(21=016-911)  $C_2 = 16$  $\left[ \begin{array}{c} c_2 = 2 \end{array} \right]$ m ( (s2 + m) + m put value OF (2 in eqn D (, + (C2 = (3) (2 + 1.1) = 2  $\frac{C_1 + 2N^2 \cdot 3N^2 + N^2 \cdot N^2 + N^2}{C_1 \cdot 2N^2 \cdot 2N^2 + N^2 \cdot N^2 \cdot N^2} = \frac{C_1 \cdot 2N^2 \cdot 2N^2 + N^2 \cdot 2N^2}{N^2 \cdot 2N^2 \cdot 2N^2 \cdot 2N^2}$ Put values of c1 f c2 in (#)  $Q_{1} = Q^{1} + 2(1)^{1} = Q^{1} + 2$ 

DOWNLOADED FROM BATU-EXAMS.in a1 - 801-1 + 160 -2 = 0 8.12 () + () = E 02 = 16 a : 02 + 1) 03:8 27-8 211 A · E 1-6 m2- 8m+16 =0 + (12) ,3 1. 1. m2 - 4m - 4m + 16 = 00 + + , )=14 = - 411 m(m-4) -4 (m-4) = 0= 0 + 10P (m-4) (m-4) =0 (2) (1p3 m=4,4 .6) ai 119 G.G 9 (3 - Ca) + Ca = 1)  $a_1 = (.(m)^{\gamma} + C_2(m)^{\gamma} O C - C_2)$ QY = C. (4) + (2(194) 2) E-Q2 =  $(. (4)^2 + (2(4)^2)$ 16 = G.G. 2 6 23  $Q_1 = (C_1 + C_2 r) m^2$ D "ar = 11(C1 + (2 2))(4)"DV - 149 92  $= ((1 + (2 (2))) (4)^2$ 16 ((1 + 2(2)) + 16)2 16 16(, + 32(2 2 (1 + 2(2))1 2 3 C1 = 1-2C2 0 ---- (2) 1114 S + 10 - = CITE LEVE

21  $a_3 = (c_1 + c_2 (3)) (4)^3$ 8 = ((1 + 3(2)) (64)8 = 164 C1 + 192 C211 1 = 8C1 + 24 C2 8(1+24(2,=1 - 3 Put eqn @ in 3 0: 0-10 - 08 + 1-08 - 10 - 0 8 (01-2(2)) + 24(2:0) 8 - 16(2 + 24(2 =1 8-8(2=1 3A 08-11 =- 18/C2 + "ME - \$ m  $\begin{array}{c}
-7 = 8(2) \\
\hline
C2 = -7 \\
\hline
8
\end{array}$  $(t_1 : (c_1 + (c_2)) (t_2)) \rightarrow For god drawn$ Put C2: 7 in eqn () - (a) (a) (c) (c) (c) (c) (c) (c) Thro bra not .  $C_1 + 2C_2 = 1$  $C_{1} + (2(-7)) = 1 = 1 = 1 = 1 = 1$  $C_{1} = (-7)$  $C_1 = 1 + \frac{7}{U}$  $\begin{bmatrix} C_1 & 1 \\ 4 \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 4 \end{bmatrix}$ 

Page\_ DOWNLOADED FROM BATU-EXAMS.in  $Q_{r} = ((1 + (2r))(m)^{r} + e^{0}$ (NO) (1)E + ,0) 50 = (11 + (-7) + (-7) + (-4) + (-7) + $\frac{2}{4} \left( \frac{11}{4} - \frac{7}{8} r^{2} \right) \left( \frac{4}{4} \right)^{\gamma} \frac{1}{12}$ pul eqn (1) in (1) Q . 9r - 39r-1 + 39r-2 - 9r-3 = 0 Q = 1 . . . Q = - 2 . . . Q = - 2 8 1= 20120 = 2001 - 2 A.E 1=2)2-8 m3 - 3m2 + 3m - 1 = 0. m = 1 . 1 . 122 2 . . . . F = c) | G.S.  $a_r : (c_1 + (2r) (m)^r - For 2nd order$  $\frac{(1)}{(1+(2\gamma)+^{2}\gamma^{2}(3)(m)^{\gamma}} - \frac{(1)}{(1+(2\gamma)+^{2}\gamma^{2}(3)(m)^{\gamma}} - \frac{(1)}{(1+(2\gamma)+^{2}\gamma^{2}(3)(m)$ For 3rd orde (1 - 20 C2 - 1)  $Q_{1} = (c_{1} + c_{2}\gamma + \gamma^{2} (3) (1)^{\gamma}$  $Q_0 = ((1 + (2(0) + (0)^2 (3) (1)^2)$ 1 = ((1 + 0 + 0) (1)) $1 = C_1 + I = I_1$  $C_1 = 1 \qquad (1 = 1)$ 

DOWNLOADED FROM BATU-EXAMS.in Date \_\_\_\_ Q, = ((c1 + (1) (2 + (1)2 (3))(1)'  $-2 = (c_1 + c_2 + c_3)(1)$ -2 = (1 + (2 + (3)) (1)) $-2 - 1 = C_2 + C_3 - E_1 - R_1$  $a_2 = (c_1 + (2)c_2 + (2)^2(3)(1)^2$ -2 = ((1 + 2(2 + 4(3)(1)))Carl Cal front correction and -2 = 1 + 2(2 + 4)(3)FITS TERSON FRANCE -3 = 2(2 + 4(3 - 2))F(1) (fr & + r 8 + 1) + -3 = 2(-3 - (3) + 4(3) $-3 = -6 - 2C_3 + 4C_3$ -3+6 = 2(3)3 = 2(3 C3 = 3

put (3 = 3 in eqn () -3 = ( (2+ (3 0) +, )) = 2-- 3 (21) C2(+) 3() + 1) = 10--3-3 - E(2+ +) = 1-2- $\frac{1}{2} - \frac{9}{2} - \frac{9}$ 83+8+ cx3 (1) (2) ((2 = 1)92 + .)) = 20 $\frac{(1)(x)(x+y)(x+y)(x+y)}{\alpha_1 - (c_1 + \gamma c_2 + \gamma^2 c_3)(m)^{\gamma}}$  $= \left(1 + \gamma \left(-\frac{9}{2}\right) + \gamma^2 \left(\frac{3}{2}\right)\right) (1)^{\gamma}$  $= \left( 1 - 9 + 3 + 3 + 2 \right) (1)^{2}$  $\frac{1-9}{2} + 3 + 2}{2} = 2$ = 8 --3+6 : 2(3 8 = 2 (3

DOWNLOADED FROM BATU-EXAMS.in Page ar + 29r-10+ 29r-2 =0  $m_{\rm A} \cdot E_{\rm M} = \frac{1}{12} m_{\rm C}^2 + 2m_{\rm C}^2 + 2m_{\rm C}^2 = 0$  $m = -1 \pm i$ G.S. 13 3 0 ar = ((, cosr 0 + c\_sinre) Pr  $\int \left( \frac{\pi \epsilon}{2} \cos R \left( 2 \sin R \right) \right) \right) \right) \right) \right)} \right) \right) \right)} \right) \right)} \right) \right) \right) \right)$  $R = \sqrt{(-1)^2 + (1)^2}$ and the air of the sense is the  $R = \int 2\pi r s r s = \int \frac{1}{2\pi s} r s = \int \frac{1}{2\pi s$  $\theta = +\alpha n^{-1} \left( \frac{B}{\alpha} \right)$  $= +an^{-1}(1)$  $0 = tan^{-1}(-1)$ <u>= π - π</u> 0 = 411-17 - 311 4

 $a_{r} = (c_{1} \cos r 3\pi)^{2} + (2 \sin r 3\pi)^{2} (\sqrt{2})^{r}$  $a_{0} = (c_{1} \cos(0) 3\pi + (2\sin(0) 3\pi)^{2} (\sqrt{2})^{0}$ = ((1+0) (i) = = m 0 = (1 3.12 . Q1 = (C, COST 0 + COSS) =  $a_{1} = ((, \cos(1)^{3}\pi + (2\sin(1)3\pi)) (\sqrt{12})^{\prime}$ = ( (1 COS 3T + (2 Sin 3T ) ( J2) -1: (0 ((05 3T) + (2 5in 3T) 12 -1 : (2 Sin 37 4 = 9 2 5 (2 2 1) (abt = 2) $\frac{-1}{\sqrt{2}} - \frac{\sqrt{2}}{2} - \frac{$ 12 12 - 11-1 C2 = -1 14 0

 $\Omega_{r} = \left( O \cos r 3 \pi + (-1) \sin r 3 \pi \right) (J_{2})^{r}$  $Q_r = \left( \begin{array}{c} 0 - 1 \\ \text{Sin} \\ 1 \\ 3 \\ \text{Sin} \end{array} \right) \left( \begin{array}{c} \sqrt{2} \\ \sqrt{2} \end{array} \right)^r$  $\alpha_r - \left(-1 \sin r 3\pi\right) \left(\sqrt{2}\right)^{\gamma}$ Perficular solp - dA = (9)10 (9)10 for Coar + Ciar-1 + Cear-2 .... (k ar-k = f(r)  $\frac{F(r) \neq 0}{Q_r} \Rightarrow \frac{d_{pq}}{d_{pq}} = \frac{h}{h} \frac{d_{pq}}{d_{pq}} = \frac{h}{h} \frac{d_{pq}}{d_{r}} + \frac{h}{Q_{r}} \frac{d_{pq}}{d_{r}} = \frac{h}{h} \frac{h}{h} \frac{d_{pq}}{d_{r}} + \frac{h}{Q_{r}} \frac{d_{pq}}{d_{r}} = \frac{h}{h} \frac{d_{pq}}{d_{r}} + \frac{h}{Q_{r}} \frac{d_{pq}}{d_{r}} + \frac{h}{Q_{r}} \frac{d_{pq}}{d_{r}} + \frac{h}{Q_{r}} \frac{d_{pq}}{d_{r}} = \frac{h}{h} \frac{d_{pq}}{d_{r}} + \frac{h}{Q_{r}} \frac{d_{$ ar Case: F(r) = b<sup>t</sup> e.g. 5' ar = A b to minere b is the root. Qz - 7Qz + 10 Qz - 2 = 3 = - \* Example . \* Q . = 0 ... a, = 1  $m^2 - 7m + 10 = 0$ A.E (M-5) (M-2) =0 2 - A m: 2,5

DOWNLOADED FROM BATU-EXAMS.in Homogeneous ne.  $q_r$  =  $c_i m^2 + c_2 m^2$  $= C_1(5)^{\gamma} + C_2(2)^{\gamma}$ 2 ( 21 - 3 / R & r mier -) - 10 Particular  $\frac{P(r)}{Q_{1}} = \frac{Ab^{2}}{Q_{2}} \cdot \frac{P(P)}{Q_{2}} \cdot \frac{P(P)}{Q_{2}} = \frac{P(P)}{Q_{2}} \cdot \frac{P(P)}{Q_{$ Put (1) in eqn \* (1) (4), p + (1), p = (1)  $A \cdot 3^{*} - 7 (A 3^{*-1}) + 10 (A 3^{*-2}) = 3^{*}$  $\frac{A3^{7} - 7A \cdot 3^{7}}{3} + \frac{10A3^{7}}{3^{2}} - 3^{7}}{3^{2}}$ ALBA FILLID TO TO DA ABAIN - stemox3  $\frac{A}{4} \begin{bmatrix} -4 + 10 \\ -3 + 29 \end{bmatrix} = \frac{1}{2} + 10 = 1$ J A  $\frac{A\left[-2\right] + \left[\frac{a}{2}\right] + \left[$ A = -9 8.5 m

DOWNLOADED FROM BATU-EXAMS.in 92 = -93 (A 103 mold Total az <u>(1) - (2) - (2)</u>  $q_{\xi} : q_1^{(p)} + q_1^{(h)}$  $= -\frac{9}{2} \frac{3^{\gamma}}{3} + \frac{(1)}{(2)^{\gamma}} + \frac{(2)}{(2)^{\gamma}} + \frac{(2)}{(2)^{\gamma}}$  $\frac{4}{2} = \frac{2}{3} + \frac{2}$  $\frac{7}{2} = 0$   $\frac{7}{2} = 0$ 0 = -9 + (i + (2))  $\frac{2}{2} + (i + (2))$  (i + (2) = 9 - 3 2 + 3P 7 8 - 01  $\frac{\xi = 1}{Q_1 = -3^{1+2} + (1(2)' + (2(5)')}$  $\frac{1}{2} = \frac{272}{2} + \frac{200}{2} + \frac{200}{2}$ 2(1 + 5(2 = 29 - 3)

From eqn @ 18,19 - P.P.  $C_1 = 9 - C_2$ 212 10157 (d) + (4) + (4) = 2P egn 🛞 (2) + (c) + (e (5) + (a (5)  $\frac{2(9-(2)+5(2-29)}{2}$  $\frac{9 - 2(2 + 5(2 - 29))}{2(2) + 2(2) + 2(2)}$ 12 ...... 9+3(2 : 29  $\frac{3C_2 - 29 - 9}{(3) + (2) + (2) + (2) + (2)} = \frac{3C_2 - 29 - 9}{26} = \frac{3C_2 - 29 - 18}{3C_2 - 29 - 18}$ 4: 10 P  $\frac{2}{2} + \frac{2}{2} + \frac{2}{2} + \frac{2}{2} = 0$   $\frac{3(2 = 11)}{(2 = 1)^{2}}$ 2×3 C2 = 11 1 = 3 241 8 - 3 10 6 1 (3) 0) Put C2: 11 in eqn (2) (101-11 : Pg = 000 + 100 6 2

-Q' -Q' - A' Y . D LOCK-CIALO 91-110 CHADALES NO. 1A 1000(AS-000, 2 -16) - (0 (A - 10)) B - 10 1A \* Put values of 1/c1 & c2 in #  $Q_{r} = -3^{r+2} + 16 (2)^{r} + 11 (5)^{r}$ \* Qr - 3Qr-1 + 2Q1-2 = 2" - + A.E . (m-2) (m-1) = 0 Homogeneous  $q_r$   $(h) = (L, m^r + (2m^r))$  $q_r$   $(h) = (L, (1)^r + (2(2)^r)$ CONTRACTOR Particular  $a_1^{(P)} = Arb^{\gamma}$  $Q_1^{(p)} = A_2^2 - 0$ Put ar(p) in eqn \*

DOWNLOADED FROM BATU-EXAMS.in A.r. 2'- E3 [A(r-1) 2'-1]+ 2[A(r-2) 2'-2]=21  $Ar \cdot 2^{r} - 3[(Ar - A) 2^{r-1}] + 2[(Ar - 2A) 2^{r-2}]$  $\frac{Ar \cdot 2^{T} - 3 [Ar 2^{T} - A2^{T}] + 2 [Ar \cdot 2^{T} - 2A2^{T}]}{2} = \frac{2}{2}$ 1031 11 + 1031 - 11 - 51 - 22 2 - 10  $\frac{A \cdot r \cdot 2^{r} - 3 \cdot A \cdot r \cdot 2^{r} + 3 \cdot A \cdot 2^{r} + 2 \cdot A \cdot r \cdot 2^{r} - 2 \cdot 2 \cdot A \cdot 2^{r}}{2}$  $\frac{2 \cdot A \cdot x \cdot 2^{\gamma} - 3 \cdot A \cdot x \cdot 2^{\gamma}}{2} = \frac{3 A \cdot 2^{\gamma} + 3 A \cdot 2^{\gamma} + 4 \cdot 4 \cdot 2^{\gamma}}{2} - A \cdot 2^{\gamma}}{2} = \frac{3 \cdot A \cdot x \cdot 2^{\gamma}}{2} = \frac{3 \cdot A$  $\frac{-1}{2}A.r.2^{\gamma} + \frac{3}{2}A.2^{\gamma} + \frac{1}{2}A.2^{\gamma} - A.2^{\gamma} = 2^{\gamma}$  $\frac{3}{2} \frac{A \cdot 2^{2} \pi}{2} = \frac{2}{2} \frac{2}{2} \frac{m^{2} 2 \cdot A^{2} (2 \cdot A^{2})}{2} = \frac{2}{2} \frac{m^{2} 2 \cdot A^{2}}}{$  $A \cdot 2^{\gamma} \left[ \frac{3}{2} - 1 \right] = 2^{\gamma}$ Particular  $\frac{A\left[\frac{1}{2}\right] + \left[\frac{1}{2}\right] + \left[\frac{1}{2}\right]$ 

DOWNLOADED FROM BATU-EXAMS.in Date\_\_\_ Put A = 2 in eqn () ()  $= a_r^{(P)} = Ar_2^r + (12aB) a - 7aB$  $Q_r = Q_r^{(P)} + Q_r^{(h)}$  $Q_r = 2 \cdot r \cdot 2^{r} + C_1 (1)^r + C_2 (2)^r$ Qr - 591-1 +691-2 =5 - + \* ≁ A [ 6 ] -A · E  $\frac{10^2 - 5m + 6}{(m - 1)^2} = 0^3$ (m-2)(m-3) = 0 $m = 2^{\circ}, 3^{\circ}, 0^{\circ}, 0^{\circ},$ Homogeneous- and the day  $\alpha_1^{(h)} = (1 (m)^{\gamma} + (2(m)^{\gamma})$  $(2) = ((1)^{2} + (2)^{2} - 0)$ Particular Sec.2 : (2. (23)  $Q_1^{(P)} = A \cdot b^{\gamma}$ - @. = A . 5'

DOWNLOADED FROM BATU-EXAMS.in eqn @ in eqn \* A Mg Put A.5 - 5 (A5 -1) + 6 (A5 -2) = 5 - $A5^{\gamma} - 5A5^{\gamma} + 6A5^{\gamma} - 5^{\gamma}$  $\frac{(A)}{(D)} = \frac{(A)}{(D)} =$  $\frac{A \left[ 1-1+\frac{6}{25} \right] - 1}{25} = \frac{1}{100} + \frac{1}{100} = \frac{1}{1$  $A\left[\frac{6}{25}\right] = 1$ 9-4  $A : \frac{25}{63} = 3 \neq m3 = \frac{2}{10}$  $a_1 (b_2 + a_1) (b_2 + a_1)$ qr = A.b" + C.m" + Com romon 2 251) 5 Y + ((1(2)) + (2 (3))  $\frac{1}{2}(5^2 \cdot 5^{\gamma} + (1)(2)^{\gamma} + (2)(3)^{\gamma}$  $\frac{5^{\gamma+2}}{2} + (\frac{1}{2})^{\gamma} + (\frac{2}{3})^{\gamma}$  colubition e. (2) months B. A.S

a, (h) FOY DOWNED ADED FROM BATU-EXAMS. in Page\_  $q_r = q_{r-1} = 6q_{r-2} = -30$ \* FOR 1 60 + (60) 10 + 8 + 10 A·E m<sup>2</sup> - m - 6 (=) (0 - , ) 8 + 8 < 8 - ... (m-3)(m+2) = 0m: 3, -2 01-2 019 - 4,19 q,(h) = CIMY + CeMY = (1 (3)"+ (2 (-2)" 3) 7.1-01-2 .20-Particular 33- 30-- <u>59</u> q,(P) : A A - A - 6A - - 30 -6A :-30 A: 30 81 5 6) + 13. 81 5 11 (+ 1) 6 12 - 12 - 1 A : 5  $= \alpha_r^{(P)} + \alpha_r^{(h)}$ a. (c-) 11 + ((e) 4 + 2 + 15  $5 + (, (3)^{\gamma} + (_2 (-2)^{\gamma}))$ Y = 0  $Q_0 = 5 + (, (3)^\circ + (2(-2)^\circ)$ 20 = 5 + (1 + 1)(1 + (2 = 15))

DOWNLOADED FROM BATU-EXAMS.in Y=1 08 - = 6-100 - 1.10 - 10 ×. -1  $Q_1 = 5 + ((3)' + (2(-2))'$ 宫一月 -5: 5+3(, -2(2) - m - 4m 0 = ( c = (a) (8 - (a) 3(1 + - 2(2 =-10 4 - 8 = 10 3 (15-(2) - 2 (2 = -1000001100001  $r m_{s}$ )  $r r m_{s}$  :  $m_{s}$ 45 - 362 - 262 - 10 -5(2 = -10-45 -5(2 = -55 rolubilars (2 2 55 A = (4),D (2:1) : BO A A 08-1 A3-(1 + (2 = 15 06 A 3 (1 + 11 = 15 ð : A C1 = L1 a, (P) + a, (b) 14 a,  $= 5 + 4(3)^{r} + 11(-2)^{r}$ ((4-3 年) + (23 1) + 日 0 2 7 \* (8-) = + \* (62) /3 + 8 + 60 2 \* . 5 \* 8 × no



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