King and field

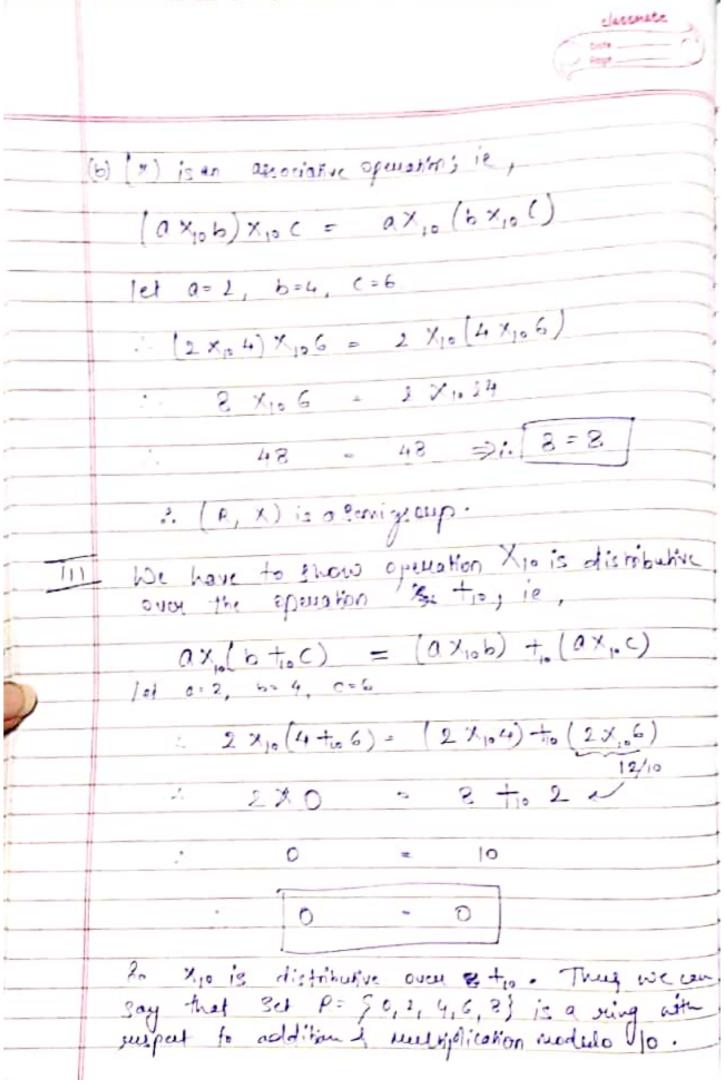
Ring: * Puopenties to perove for a using ER condition to be savified for a ming- (A,+,.) * (i) puève closure Operation (ii) prieve ausciative operation (111) perove identity (left 1 right) speration (iv) Inveces operation V) commutative operation. Stiffer proving all 5 condition we can say (A,+) is a commutative/abelian grays operation for multiplication (ii) (·) is an associavite operation for multiplicationie, (axb)xc= ax(bxc) $\mathfrak{D}(A, \cdot)$ is distributive, i.e. (\cdot) is distributed $\mathfrak{D}(A, \cdot)$ ie $\mathfrak{a} \times (b+c) = (\mathfrak{a} \times b) + (\mathfrak{a} \times c)$ # Integral Domain: - 3 necessary conditions tou as I am integal domain. (1) It is a communative my (ii) It has no zero divisore identity element given in notes (iii) It has no zeno divisone # field: - 3 necessary conditions for this kind of rings (i) It is commutative one group Abelian group.

(ii) It has a curity (1) climent (muliplicative identity element) (ii) Every non-zero element in The table has a multiplication inverse Note: A field is an integral domain. However, not

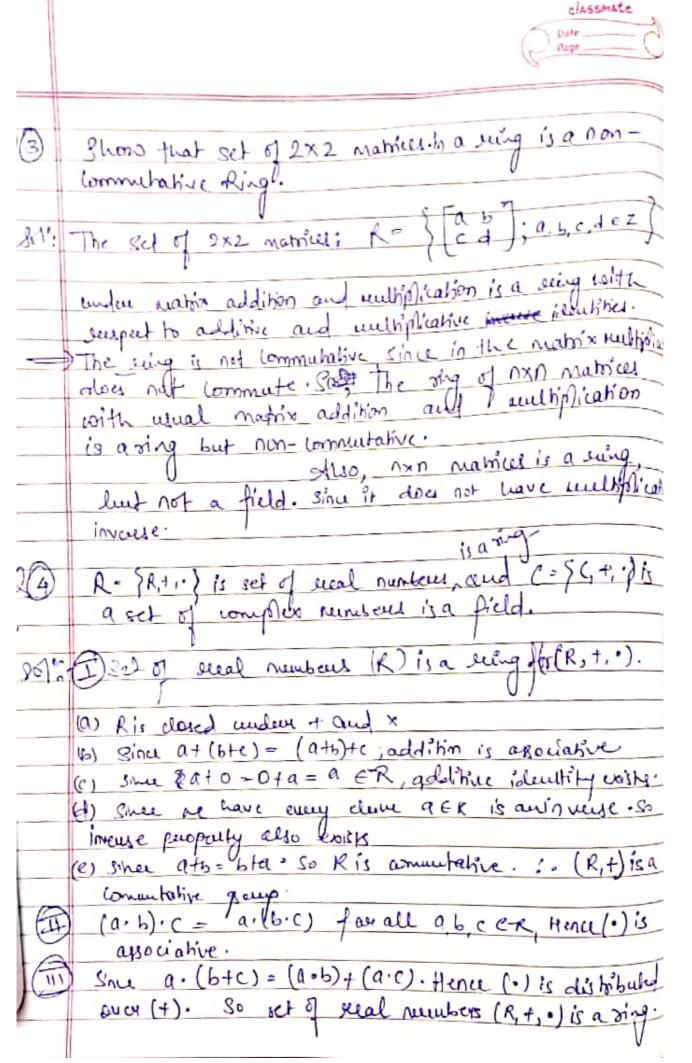
every integral dorhain

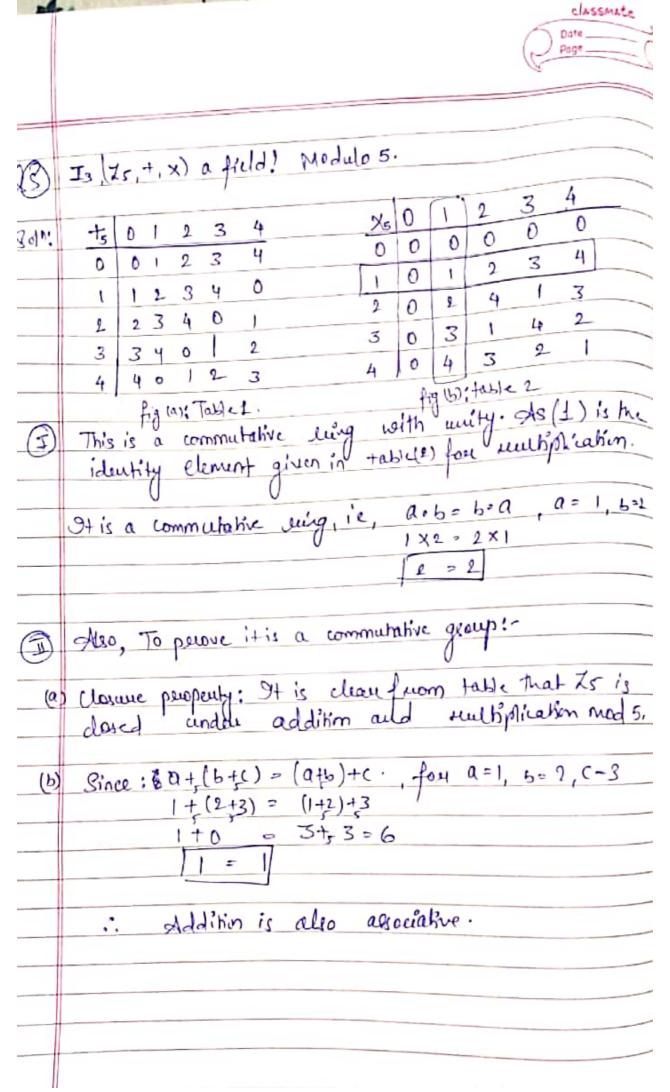
Re	38	3	4 (02	-						0	a da	1.70
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)(R	+	. \	1		la.		1		,	- 1	٧		
			CLIC	400.	The	136	£ -10) H	ie	and	~10		
110	0	5	4	G	8		X.	0	2	4	6	3	
0	0	2	4	6	3		_	0		٥	0	0	-
			G				1	0	4	8	2	6	-
			8		1		4	0	8	6	4	8	-
G	G	8	0.	2	4		C	0			6		
E			2					0			8		
		His	(2);	Tak	e(1)					fig b): Jal	Je (4)	
1 10	e h	ave	+0	Sm	000 (R	(0)	1.5	an	abe	ian	95040	:- '
(a) -	115	13 0	r clo	aea	opeu	alian	. 31	166	12	LOM	13	a) th 0,1,4	_
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No	(Mag)	اد یا	ио	0 =	4	5-6	6,	C = 3	3				
0	Ily pasue for a=4, 6-6, C=8												
(a+1, b)+1, c = 0+10 (b+1, c)													
i													
										Sco	nnad l	w Cam	Scanna

(0	I dentity element from fig (a) is table 1 is 'O'.
	Q + a = a = a + 0 0
	Doto 0 = 0 Right identity Otto 0 = 0
	1 0 to 2 = 2 2 to 0 = 2
	3 0 +10 4 = 4 4 +10 0 = 4
	(3) 0+10 6 = 6 6 +10 0 - 6 (5) 0+10 6 = 8 8 +10 0 - 6
	(2) Oto 8 = 8 8 +10 D = 8.
10	T.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
L	Invale: - 0 to 0 = 0, 2 to 8 = 0, 4 + 6 = 0,
	6 to 4 = 0 . 8 to 2 = 0
	OR 0-1=0, 27=8, 4-1=6, 6-1-4,8-1=2.
10	Commutative supposed - at Ltc alle
	Commutative perspectly: - atiobtic - ctibtea.
	1. 2 to 4 to 6 = 6 to 4to 2
	12 = 12
	$\frac{1}{10} = 12$
	i. (R, +) is an abelian Commutative group.
II	(R,X) is a semigloup?-
	0 1
(0)	that all the clining of the toble (2) it is clearly that all the clining of the toble (2) belong to the set R. 30 clayance openation is prevent.
	that all the clining of the table (2)
	belong to the set R. 80 clayare operation is
	peroval.



	Integral domain;
(a)	It is a communative duing ie a.b = 6.a. 2x4=4x2
	a commande allag le a.b = 6.a.
	** (8 = 5)
(P)	with unity element: - I set of even integrety with
	usual Copenation of + and x ic, (Rit, x) is
	a commutative eving without unity. Can be
	a commutative every without writy. (an be seen in table (2). [those Given in notes on pg 16-18]
(c)	geno with usual + and x is not in the
_	geno with usual + and x is not an integral
	deman decause it along not have a distant
	[(1100) in notes on 19 16-54).
	There fore (R) is not an integral domain. theo,
	the non-zero elments of table (2) are not without zero tivisoner
	not exist a three multiplicative identity does
	mule cannot be a multiplication
	invoue. Hence it is not a field.
	So, & (R,+,x) is a wing. But it is not
	So, It (R, +, x) is a using. But it is not an integral domain and neither a field.





(I Identify: 'D' is the identify element for table 1.									
	So, o+a = a = a+o for all a ∈ Zs.									
	0+1=1=1+0									
	0+52 = 2 = 2+50									
	0+s3 = 3 = 3+s0									
	0+54=4=4+50									
	So 'Filis an identity is proved.									
(9)	Additive inverse: 1+54=0, 2+53=0, 3+52=0,4+1=0									
	So itt additive invouse exists.									
(e)	2 in communative peroporty: at6=6+a 1+2 = 2+1									
	3 = 3									
	go addition is commutative.									
	i. (7- +) is a communication of an									
	i. (Z5, +) is a commutative gloup.									
11	Distributive perspecty: - ax(6+c)= (axb) + (Bxc)									
-	$1 \times (2+3) = (1 \times 2) + (1 \times 3)$									
	1×0 = 2+3=5									
	10 = 0									
	30, the () 撰 is distributed over (+).									
(IX)	I since (1) is the muliphiphive identity element as seen from table (2), so the multiphicative invesure also									
	from table (2), so the multiplicative invesure also									
	exist, ie, 1x1=1, 2x3=1, 8x2=1, 4x4=1, ie, 1-1=1, 2-1=3, 3-1=2, 4-1=4.									
	ic, 1-=1, 2-=3, 3-=2, 4-=4.									
	A 1									
	?. (75,+, x) is a field.									

06	Ts	(26,+	(x)	a filla	9
5			,	/	•

800	:- This questionis same as perevious puoblem.
	But it is not a diela lucause the machine conse
	lawrette class and evict even Though
	as identify element in multiplication table(e)
1	()

+	012345	X	0	[]	2	3	4	5
0	011345	0	0	0	0	0	0	0
1	123 4 5 0	11	0	1	2	3	4	5
2	234501	2	0	2	4	0	1	4
3	3 4 5 0 1 2	3	0	3	0	3	0	3
4	450 123	4	0	4	2	0	4	2
5	501234	5	0	5	4	3	2	-1
				-				