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	Pol. no - 42
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<u>Q1.</u>	Solve the following with forward chaining or backward chaining or resolution we predicate logic as language of knowledge representation clearly specify the facts and inference rate used.
	Little and the last of the las
	Example 1:
	it Every child specs some which no which has both a black cat & a pointed hat.
Æ	et Every witch is good or bad
(12)	37 Every child who sees any good witch gets candy.
	by Fuery witch that is bad has a black cat.
	5) Every witch that is seen by any child has a pointed hat.
	57 Prove: Fuery child gets condy.
	A) facts into fol.
	it = xAx (child(x), witch(y) -> sees(x, y)).
	~ 74 (witch (y) > has (y, black cat) ~ has (y, pointed hat)
	2) = y (witch (y) >> good (y) vbad. (y))
	3) Ex ((sees (x,y) -> (witch (y) u bad (y)) get (x, candy)
	4) Ey ((witch (y) -> bod(y)) -> has (y -> black hat)
	5) Ey (ssees (x,x) > hos (y, pointed hat)
	B) FOL into CNF
	is 3 x Ax (child (x), witch (y) -> sees (x, y))
	27 Jy, (with (y) - has (y, black cat)
	-> ~ 3y (witch (y) -> has (y, pointed hat)
	e) ty (witch(y) -> good(y))
	yy (witch (y) → bod (y))
	3) Ex [(sees(x,y) + witch (y) > good (y)) > gets (x, andy)
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	> Ex[(sees (x, good (y) > gets (x, condy))]				
O consequent	4) Ey [had(y) -> has (y, black hats)]				
	5) Ey [seen (x,y) > has (y, pointed hat]				
	> ~ y [Seen (xy) -> has (y black hat)]				
	sees (x,y) witch (y) v sees (x,y)				
	Egood u bad ly y				
	Find a description of the second state of the				
	~seen (x,1900d) hsees (x,bad) has (y,z)				
	Eglgood v bad 3				
*	2 Z/ black cat V				
	pointed hat) 3				
	Seen (x, good) useen (x, bad) has (good, pointed				
	hals uget (x, candy)				
	seen(x, good) u has (good, seen (x, good) v pointed hat) u gets gels (x, candy) (x, condy)				
	2015 (v coodu)				
	gets (x, condy) Example 2: 1) Every boy or girld is a d child.				
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,					

	?) Fuery child gets a doll or a train or a lump of coal:
	3) No boy gets ony doll -
	47 Every child who is had gets any lump of coal.
	s) No child gets a train
	6) Ram gets lump of coal.
	T) Prove Ram is bad.
	-> 17 AX (pod/x) or divig (x) > child (x))
	2) & y (child (y) > gets (y, do 11) or gets (y, train)
	or gets (y, coal)
	3) A m (pon (m) → 1 d6+2 (m, qoll)
	4) for all z (child(z) and bad(z)) -> gets(z, coal))
	yy child (y) → 1 gets (y, train)
	57 Child (ram) -> gets (ram, coal)
	To prove (child (ram) -> bad (ram)
	TO Purity View
	CNEclauses
	$7 \times 1 \times $
(8)	! girl(∞) or child (α)
	2) I child (y) or gets (y, doll) or gets (y, train) or gets (y, roal)
	3) ! chay (v) or ! gets (w, doll)
	4) 1 child (z) or ! bad (z) or gets (z, coal)
	57 ! child (ram) 7 gets (ram, coal)
	6) bad (ram)
	6/ 500
	Resolution
	4) 1 child (2) or 1 bad (2) or get (2, goal)
	61 bad (ram)
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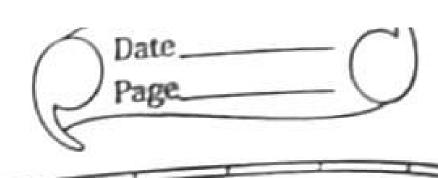
	7 1 - 1 1 1 60 1 200 6
	T) ! child (from) or gets (ram, coal)
	Substituting 2 by ram
	is (a) 1 boy (x) or child (sc) boy ram
- 11	2) child ram (substituting x by rom)
- 11	8) child (ram) or gots (ram, coal)
	9) gets (ram, coal)
- 11	10) ! child (y) (or gets (y, doll) or gets (y, train) or gets (y, coal)
11	
	10) gets (ram, doll) or gets (ram, train) or gots (ram, coal)
- 1	9) gets (rom, coal)
	107 gets (ram, doll) or gets (ram, train) or gets (rom, roal)
	3) ! boy (w) or ! gets (w, doll)
	5) boy (ram)
	127 Last (ram, doll) substituting w by ram)
	11) gets (ram doll) or gets (ram train)
	13> ! gets (ram doll)
1	12) gets (ram, coal)
	67 car get (ram, coal)
1	137 gets (nam, coal)
*	Hence, bad (ram) is proved.
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(3) Goals are conjunctions for (3) (Mools may involves e.g.: (Intelligent A beautiful) Confunction & disjunctions

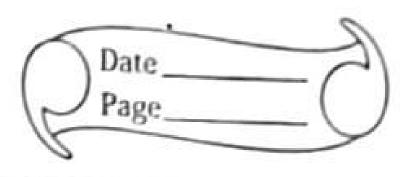
(3) (Thools may involves

(Beautiful A Rich)

for e.g. : [Intelligent A



A P(T) A pour base two neighbors T and M, who have promised to call you at work when they here promised to call you at work when they here the alarm T always calls when he hears the the alarm but sometimes confused telephone ringing alarm but sometimes misses the alarm music and sometimes misses the alarm had called we would like to estimate the probability of burdary brow a Bayeslan network for this domain with suitable probability table. P(E) 0.001 (Burglary) (Farthquake) 0.0021 (Alarm) B E P(B) F T 0.95 T F 0.99 F T 0.29 F T 0.29 F F 0.001 D The topology of the network indicates that Burglary and earthquake affect the probability Scanned by Tassans				6			
promised to the solutions calls when he hears the the alarm Jalways calls when he hears the the alarm of the solution of the solution of the solution of the solution of the evidence of who has a has been alarm musts and sometimes misses the alarm musts and sometimes misses the alarm musts and sometimes misses the alarm together Given the evidence of who has a has been has a has been alarm together Given the evidence of who has a has been has a has been alarm together Given the evidence of who has a has been alarm together Given the evidence of who has a has been alarm together the probability together the probability together the probability. P(E)							
promised to the solvery calls when he hears the the alarm Jalways calls when he hears the the alarm Jalways calls when he hears the alarm but sometimes confused telephone singing with alarms of calls then too. Milites loud with alarms of calls then too. Milites loud with alarms of calls the evidence of who has on has together Given the evidence of who has on has together Given the evidence of who has on has together Given the evidence of who has on has together Given the evidence of who has on has together Given the evidence of who has on has together Given the evidence of who has on has together Given the evidence of who has on has together Given the evidence of who has on has together Given the together Given the evidence of who has on has together Given the together Given the for this domain with suitable probability P(E) P(B) P(B) P(B) P(B) P(B) P(B) P(B) P(C) P					- h a.m		
promised to the property of the alarm of always calls when he bears the the alarm of always calls when he bears the alarm with alarms of calls then too. Molites loud with alarms of calls then too. Molites loud with alarms of calls then too. Molites loud with alarms of called we would like to estimor the probability of burdary. Drow a Bayestan network for this domain with suitable probability table. P(B) P(B) P(B) P(B) P(B) P(C) P(B) P(C) P(B) P(C) P(B) P(C) P(B) P(C)		Lan neighbors I and	M,	W1101	-au herr	•	
the alarm Jalloused telephone ringing alarm but sometimes confused telephone ringing with alarm music and sometimes misses the alarm host called use would like to estimon the probability of burglary. Drow a Bayestan network for this domain with suitable probability table. P(B) P(B)	Q4)	promised to call you shen he hears the					
alarm, but samelines misses the alarm must and sometimes misses the alarm together Given the evidence of who has or has together Given the evidence of who has or has not called we would like to estimot the probability of burgary Drow a Bayesian network for this domain with suitable probability table. P(B) O.DOI (Burglary) (Farthquake) P(C) F T 0.95 F T 0.95 F T 0.29 F F 0.001 Tohn (Calls) A P(T) T 0.09 F 0.05 A P(T) T 0.09 F 0.001 D The topology of the network indicates that -Burglary and corthquake affect the probability							
music and sometimes misses the alarm music and sometimes misses the alarm together Given the evidence of who has 05 has together Given the evidence of who has 05 has not called use would like to estimoth the probability of burgary. Drow a Bayesian network for this domain with suitable probability table. P(B) P(B) P(B) P(B) P(B) P(B) P(B) F T 0.95 F T 0.95 F T 0.29 F F 0.001 Tahn T 0.09 F T 0.70 F T 0.70 F T 0.70 F D.005 The topology of the network indicates that Burglary and earthquake aftect the probability		the alarm s always confuse	d tel	ephone	ringir	79	
music and sometimes of who has as has together. Given the evidence of who has as has not called use would like to estimate the probability of burgary. Drow a Bayesian network for this domain with suitable probability table. P(B) P(C) P(C		alarm but something then to	00. M	likes	loud		
together Given the evidence the not called use would like to estimote the not called use would like to estimote the probability of burgary. Orow a Bayeston network for this domain with suitable probability table. P(B) P(C) P(
probability of burgary. Draw a Bayeston network for this domain with suitable probability table. P(B) 0.001 (Burgary) (Earthquake) 0.002) (Plann) B E P(P) F T 0.95 T F 0.94 F T 0.29 F F 0.001 Tohn (Calls) (Calls) A P(T) T 0.09 F 0.05 The topology of the network indicates that Burglary and earthquake affect the probability.		music and sometimes	of u	sho h	as or	has	
probability of burgary. Brow a superbability table. for this domain with suitable probability table. P(B) 0.001 (Burglary) (Earthquake) 0.0021. P(B) F T 0.95 F T 0.97 F T 0.29 F F 0.001 Tohn Calls (Calls) A P(T) T 0.09 F 0.01 T 0.70 F 0.01 T 0.70 F 0.01 T poly A P(M) T O.70 F O.01		together Given the evidence	e.stic	n 0 tr_	the		
for this domain with switche propositing assistant of the probability For this domain with switche propositing assistant of the probability For this domain with switche propositing and earthquake affect the probability P(E)		not called me mone like	a 80	resta	n netw	ork	
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A P(T) A P(T) A P(T) Toba F Doba Calls A P(T) T Doba Calls A P(T) T Doba Calls A P(T) A P(M) A P		for this domain with suitable	Pol	урор	1		
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A P(T) A P(T) T O.09 A P(T) T O.09 A P(D) T O.09 F O.00 A P(M) T O.00 F O.01 T O.00 Burglary and earthquake affect the probability	→	P(B)	- 11-0	ake)	V 003 3		
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F T 0.95 T F 0.94 F T 0.29 F F 0.001 A P(T) T 0.09 T 0.70 F 0.01 T 0.70 F 0.01 The topology of the network indicates that Burglary and earthquake affect the probability							
F T 0.95 T F 0.94 F T 0.29 F F 0.001 A P(T) T 0.09 T 0.70 F 0.01 T D.70 F D.01 The topology of the network indicates that - Burglary and earthquake affect the probability				T _		1	
T F 0.94 F T 0.29 F F 0.001 Tohn (alls) (alls) (alls) A P(T) T 0.09 F 0.05 F 0.01 The topology of the network indicates that - Burglary and earthquake affect the probability	.	(Alaxa)	B	E		+	
F T 0.29 F F 0.001 Tohn (many (calls)) A P(T) T 0.09 F 0.05 F 0.01 The topology of the network indicates that -Burglary and parthquake affect the probability			⊢F	T			
Tohn (many) (alls) (alls) (alls) (alls) (alls) (alls) (alls) (b) The topology of the network indicates that - Burglary and earthquake affect the probability			<u> </u>	F	0.94		
(John (mary) (calls) (Calls) (Calls) (Calls) (Differ topology of the network indicates that -Burglary and earthquake affect the probability			 	T_	0.29		
A P(T) A P(M) T 0.09 F 0.05 F 0.01 The topology of the network indicates that -Burglary and earthquake affect the probability			↓ F	F	0.001		
A P(T) A P(M) T 0.09 F 0.05 F 0.01 The topology of the network indicates that -Burglary and earthquake affect the probability			>				
A P(T) T 0.09 F 0.05 Burglary and earthquake affect the probability							
T 0.09 F 0.05 The topology of the network indicates that -Burglary and earthquake affect the probability							
T 0.09 F 0.05 The topology of the network indicates that -Burglary and earthquake affect the probability		A P(T)		A	P(m)		
D'The topology of the network indicates that -Burglary and earthquake affect the probability				T			
The topology of the network indicates that -Burglary and earthquake affect the probability		F 0.05		F			
	1 The topology of the network indicates that						
		- Burglary and earthquake affect the probability					
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		=
	of the alarms going off.	-
	wheather John and Mary call depends only on	
	alarm.	
	-They do not perceive any burglaries directly they	
	do not notice minor earthquotes and they do not confer before calling.	
	2) Mary listening to loud music & John confusing	
	phone ringing to sound of alorm can be read	
	from network only implicitly as uncertainty	
-	associated to calling at work	
	3) The probability actually summarize potentially	
	infinite sets of circumstances. Pr due to high	
	The alarm might full to go off due to high humidity, power failure, dead bottery, cut wines,	
	a dead mouse stuck inside the bell, etc.	<u> </u>
	John and many might fail to call and report	 -
	alarm because they are out to lunch, an	_
	vacation, temporarily deaf, passing helicopter,	
	exc.	
	The modition probability tables in nlw gives	
	for values of mandom vanables.	
	depending, an combination of values for the	- -
	parent nodes	-
	s) Each move must be sum to 1, because entires represent exhaustive set of cases for variable.	
	Boolean	-]
	6) All variable are Boolean. 3) In general, a table for a Boolean variable.	-]
	1) In general, a table to independently specific.	
	probabilities.	
	Probabilities	
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