			Date: 28/03/2023
			Score: <u>/ 3</u>
	Student ID:	Student name:	
check w [0.5pt]	whether KB entails Y .	following propositional knowledge base. Please he knowledge base to its rule form. 5	 ¬R ∨ ¬Z ∨ C ¬B ∨ D
3.		7	 4. ¬D ∨ ¬R ∨ Z 5. B 6. R ↔ D
sentenc order. A	es your inference comes fro Add more lines if necessary	ving Backward Chaining. Note that, for every stoom. Sub-goals at the same levels are processed follo	owing the alphabetical
Questic	o n 2 (1pt) (A ↔B) entails (A	$(A \wedge B)$. Explain why the given statement is TRUE	(or FALSE).

Duration: 15 mins

Duration: 15 mins Date: 28/03/2023 Score: / 3 Student ID: Student name: Question 1 (2pts) Consider the following propositional knowledge base. Please 1. $\neg B \lor \neg C \lor A$ check whether KB entails F. 2. $\neg D \lor \neg E \lor B$ [0.5pt] Convert each sentence in the knowledge base to its rule form. 3. $\neg G \lor \neg E \lor B$ 5. 1. 4. $\neg E \lor C$ 2. _____ 5. D 3. 7. _____ 6. E 4. 7. $\neg A \lor \neg G \lor F$ [1.5pt] Perform inference by applying **Backward Chaining.** Note that, for every step, state clearly which sentences your inference comes from. Sub-goals at the same levels are processed following the alphabetical order. Add more lines if necessary **Question 2 (1pt)** Conjunctive normal form is a representation in which the KB is a conjunction of clauses where each clause is a conjunction of literals. Explain why the given statement is TRUE (or FALSE).

	Duration: 15 mins	
		Date: 28/03/2023
		Score: /3
Student ID:	Student name:	
Question 1 (2pts) Consider the following check whether KB entails Y. [0.5pt] Convert each sentence in the known of the kn	rward Chaining. Note that, for every steehere are multiple rules that are ready to be seck whether a propositional knowledge base. Please of the propositional knowledge base.	1. $\neg C \lor \neg D \lor Y$ 2. $\neg R \lor \neg Z \lor C$ 3. $\neg B \lor D$ 4. $\neg D \lor \neg R \lor Z$ 5. B 6. $R \leftrightarrow D$ ep, state clearly which be triggered at a time,

	Duration: 15 mins	
		Date: 28/03/2023
		Score:/ <u>3</u>
Student ID:	Student name:	
Question 1 (2pts) Consider the fol	llowing propositional knowledge base.	1. ¬B∨¬C∨A
Please check whether KB entails F .		2. ¬ <i>D</i> ∨ ¬ <i>E</i> ∨ <i>B</i>
[0.5pt] Convert each sentence in the	e knowledge base to its rule form.	3. $\neg G \lor \neg E \lor B$
1	5	4. ¬E∨C
2	6	5. D
3	7	6. <i>E</i>
4		7. $\neg A \lor \neg G \lor F$
rentences your inference comes from top to bottom	ing Forward Chaining. Note that, for m. If there are multiple rules that are n	ready to be triggered at a time,
Question 2 (1pt) <i>Backward chaining</i> Explain why the given statement is T	g uses breadth-first search and forward TRUE (or FALSE).	chaining uses depth-first search.

SOLUTION

D	Ouration: 15 mins	Date: 28/03/2023
		Score: <u>/ 3</u>
Student ID:Stu	udent name:	
Question 1 (2pts) Consider the following percheck whether KB entails Y. [0.5pt] Convert each sentence in the knowled of the convert each sentence in the convert e	· · ·	 ¬R ∨ ¬Z ∨ C ¬B ∨ D ¬D ∨ ¬R ∨ Z B
4. $\underline{D \wedge R \rightarrow Z}$		6. $R \leftrightarrow D$
order. Add more lines if necessary The goal Y requires C and D from (1) Subgoal C requires R and Z from (2) Subgoal R requires D from (6) (*)		
Subgoal Z requires D and R from (4)		
Both subgoals are satisfied from the ab		
Subgoal D is satisfied from the above steps (*	·*)	
Thus, KB entails Y.		
Question 2 (1pt) $(A \leftrightarrow B)$ entails $(A \land B)$. Exp FALSE. $(A \leftrightarrow B) \equiv (A \land B) \lor (\neg A \land \neg B)$. When A model making $(A \leftrightarrow B)$ true also makes $(A \land B)$	plain why the given statement is TRUE ($= B = false$, (A \leftrightarrow B) is true, yet (A \land B) is the state of the	(or FALSE). false. Thus, not every

D	uration: 15 mins	Data: 39/02/2022
		Date: 28/03/2023
		Score: <u>/ 3</u>
Student ID: Stu	ıdent name:	
Question 1 (2pts) Consider the following periods whether KB entails F . [0.5pt] Convert each sentence in the knowled		 ¬B ∨ ¬C ∨ A ¬D ∨ ¬E ∨ B ¬G ∨ ¬E ∨ B
1. <u>B ∧ C → A</u>	5. <u>D</u>	4. ¬E∨C
2. <u>D ∧ E → B</u>	6. <u>E</u>	5. D
3. <u>G ∧ E → B</u>	7. <u>A ∧ G → F</u>	6. <i>E</i>
4. <u>E → C</u>		7. $\neg A \lor \neg G \lor F$
sentences your inference comes from. Sub-goa order. Add more lines if necessary The goal F requires A and G from (7)		
Subgoal A requires B and C from (1)		
Subgoal B requires D and E from (2)		
Subgoals D and E are given in (5) and (6	5)	
Subgoal C requires E from (4)		
Subgoal E is given in (6)		
Subgoal G cannot be obtained from any of the	ne available rules $ ightarrow$ the inference process	s fails in this step
Thus, KB does not entail F.		
Question 2 (1pt) Conjunctive normal form is where each clause is a conjunction of literals. E	•	-
FALSE. Conjunctive normal form is a representat	ion in which the KB is a conjunction of clau	ses where each clause
is a DISJUNCTION of literals.		

שוע	uration: 15 mins	D
		Date: 28/03/2023
		Score: / 3
Student ID: Stu	dent name:	
Question 1 (2pts) Consider the following p	ropositional knowledge base. Please	$1. \neg C \lor \neg D \lor Y$
check whether KB entails Y .		2. $\neg R \lor \neg Z \lor C$
[0.5pt] Convert each sentence in the knowled	ge base to its rule form.	3. $\neg B \lor D$
1. $C \wedge D \rightarrow Y$	5. <u>B</u>	4. $\neg D \lor \neg R \lor Z$
2. $R \wedge Z \rightarrow C$	6. <u>R → D</u>	5. <i>B</i>
3. <u>B → D</u>	7. <u>D → R</u>	6. $R \leftrightarrow D$
4. $D \wedge R \rightarrow Z$		0. <i>R V D</i>
process them from top to bottom.		
The initial fact is B. From (3) and (5), we have D (8) From (7) and (8), we have R (9) From (4), (8), and (9), we have Z (10) From (6) and (9), we have D again		
The initial fact is B. From (3) and (5), we have D (8) From (7) and (8), we have R (9) From (4), (8), and (9), we have Z (10)		
The initial fact is B. From (3) and (5), we have D (8) From (7) and (8), we have R (9) From (4), (8), and (9), we have Z (10) From (6) and (9), we have D again From (2), (9) and (10), we have C (11)		
The initial fact is B. From (3) and (5), we have D (8) From (7) and (8), we have R (9) From (4), (8), and (9), we have Z (10) From (6) and (9), we have D again		

Γ	Ouration: 15 mins	Date: 28/03/202
		Score: /:
Student ID: St	ident name:	
Student IDSti	udent name:	
Question 1 (2pts) Consider the following	propositional knowledge base. Please	1. ¬B∨¬C∨A
check whether KB entails F .		2. ¬ <i>D</i> ∨ ¬ <i>E</i> ∨ <i>B</i>
[0.5pt] Convert each sentence in the knowled	dge base to its rule form.	3. $\neg G \lor \neg E \lor B$
1. B∧C→A	5. <u>D</u>	4. ¬E∨C
2. $D \wedge E \rightarrow B$	6. <u>E</u>	5. D
3. <u>G∧E→B</u>	7. $A \wedge G \rightarrow F$	6. <i>E</i>
4. <u>E → C</u>		7. $\neg A \lor \neg G \lor F$
[1.5pt] Perform inference by applying Forw sentences your inference comes from. If the process them from top to bottom	_	=
The initial facts are D and E.		
From (2), (5), and (6), we have B (8)		
From (4) and (5), we have C (9)		
From (1), (8), and (9), we have A (10)		
We cannot generate any other clause, and we	haven't reached F yet.	
Thus, KB does not entail F.		
Question 2 (1pt) <i>Backward chaining uses bre</i> Explain why the given statement is TRUE (or		uses depth-first search
FALSE. Backward chaining uses depth-first sear	ch and forward chaining uses breadth-firs	st search.