**I would like to use 1 extension day.**

Question 1:

Question 2:

|  |  |
| --- | --- |
| S |  |
| 0 | 1 |
| 1 | 1 |

This is valid.

1. :

|  |  |  |
| --- | --- | --- |
| S | C |  |
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 1 |

This is satisfiable.

|  |  |  |  |
| --- | --- | --- | --- |
| S | C | F |  |
| 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 |
| 1 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 |

This is satisfiable.

1. :

|  |  |  |
| --- | --- | --- |
| S | C |  |
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

This is satisfiable

1. :

|  |  |  |  |
| --- | --- | --- | --- |
| S | C | F |  |
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |

This is valid.

Question 3:

1. (2) ∀x GreenFood(x)Delicious(x)

(3) ∀x ¬OrganicFood(x)HealthyFodLiver(x)

(4) ∀x ¬GreenFood(x) ⇒ ¬Recommend(x)

(5) Ǝx OrganicFood(x) ⇒ Delicious(x)

Question 4:

1. (i) ∀x lion(x)carnivore(x); ∀x tiger(x)carnivore(x); ∀x leopard(x)carnivore(x)

(ii) ∀x ∀y lion(x) ∧ offspring (x,y) lion(y)

(iii) ∀x lion(x) ∧ name (x,Simba) lion(Simba)

(iv) offspring (Simba, Sarani)

(v) parent(Simba, Kion)

(vi) ∀x ∀y parent( x,y) ⟺ offspring(y,x)

(vii) ∀x carnivore (x) parentExist(x)