Ling 320. Assignment 7 Solution.

Part 1. Using the Oct 18th class grammar, provide derivations of the truth conditions for each of the following:

(1) For any s, $[\![\text{S}]\!]^s = 1$ iff

$[\![\text{DP}_1]\!]^s \in [\![\text{VP}]\!]^s$	(a)
$\text{L} \in [\![\text{VP}]\!]^s$	(b) x 2, (c)
$\text{L} \in [\![\textit{dressing}_{\text{refl}}]\!]^s$	(b) x 2
$\text{L} \in \{x \mid \langle x, x\rangle \in [\![\textit{dressing}]\!]^s\}$	(c)
$\text{L} \in \{x \mid \langle x, x\rangle \in \{\langle y, z\rangle \mid y \text{ is dressing } z \text{ in } s\}\}$	(c)
$\text{L} \in \{x \mid x \text{ is dressing } x \text{ in } s\}$	$\in$
L is dressing L in s	$\in$

(2) For any s, $[\![\text{S}]\!]^s = 1$ iff

$[\![\text{DP}_1]\!]^s \in [\![\text{VP}]\!]^s$	(a)
$\text{C} \in [\![\text{VP}]\!]^s$	(b) x 2, (c)
$\text{C} \in [\![\text{DP}_2]\!]^s$	(b)
$\text{C} \in [\![\text{NP}]\!]^s$	(c)
$\text{C} \in \{x \mid \langle x, [\![\text{DP}_3]\!]^s\rangle \in [\![\text{N}_t]\!]^s\}$	(f)
$\text{C} \in \{x \mid \langle x, \text{MLK}\rangle \in [\![\text{N}_t]\!]^s\}$	(b) x 2, (c)
$\text{C} \in \{x \mid \langle x, \text{MLK}\rangle \in [\![\textit{fan}]\!]^s\}$	(b)
$\text{C} \in \{x \mid \langle x, \text{MLK}\rangle \in \{\langle y, z\rangle \mid y \text{ is a fan of } z \text{ in } s\}\}$	(c)
$\text{C} \in \{x \mid x \text{ is a fan of MLK in } s\}$	$\in$
C is a fan of MLK in s	$\in$

Part 2. (You will be able to do this as of Tuesday, October 23rd). Using the Oct 23rd class grammar, provide derivations of the truth conditions for each of the following:

(3) For any s, $[\![\text{S}]\!]^s = 1$ iff

$[\![\text{VP}_1]\!]^s \in [\![\text{DP}]\!]^s$	(g)
$[\![\text{VP}_1]\!]^s \in \{A \mid \langle [\![\text{NP}]\!]^s, A\rangle \in [\![\text{D}]\!]^s\}$	(h)
$\langle [\![\text{NP}]\!]^s, [\![\text{VP}_1]\!]^s\rangle \in [\![\text{D}]\!]^s$	$\in$
$\langle [\![\text{NP}]\!]^s, [\![\text{VP}_1]\!]^s\rangle \in [\![\textit{every}]\!]^s$	(b)
$\langle [\![\text{NP}]\!]^s, [\![\text{VP}_1]\!]^s\rangle \in \{\langle A, B\rangle \mid A \subseteq B\}$	(c)
$[\![\text{NP}]\!]^s \subseteq [\![\text{VP}_1]\!]^s$	$\in$
$[\![\text{NP}]\!]^s \subseteq ([\![\text{VP}_2]\!]^s\ [\![\text{Conj}]\!]^s\ [\![\text{VP}_3]\!]^s)$	(d)
$[\![\text{NP}]\!]^s \subseteq ([\![\text{VP}_2]\!]^s\ [\![\textit{and}]\!]^s\ [\![\text{VP}_3]\!]^s)$	(b)
$[\![\text{NP}]\!]^s \subseteq ([\![\text{VP}_2]\!]^s \cap [\![\text{VP}_3]\!]^s)$	(c)
$[\![\text{N}]\!]^s \subseteq ([\![\text{VP}_2]\!]^s \cap [\![\text{VP}_3]\!]^s)$	(b)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\text{VP}_2]\!]^s \cap [\![\text{VP}_3]\!]^s)$	(b)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\text{V}_{i,2}]\!]^s \cap [\![\text{VP}_3]\!]^s)$	(b)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\textit{hurried}]\!]^s \cap [\![\text{VP}_3]\!]^s)$	(b)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\textit{hurried}]\!]^s \cap [\![\text{V}_{i,3}]\!]^s)$	(b)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\textit{hurried}]\!]^s \cap [\![\textit{ate}_{\text{eod}}]\!]^s)$	(b)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\textit{hurried}]\!]^s \cap \{x \mid \exists y[\langle x, y\rangle \in [\![\textit{ate}]\!]^s]\})$	(b)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\textit{hurried}]\!]^s \cap \{x \mid \exists y[\langle x, y\rangle \in \{\langle z, k\rangle \mid z \text{ ate } k \text{ in } s\}]\})$	(c)
$[\![\textit{squirrel}]\!]^s \subseteq ([\![\textit{hurried}]\!]^s \cap \{x \mid \exists y[x \text{ ate } y \text{ in } s]\})$	$\in$
$[\![\textit{squirrel}]\!]^s \subseteq (\{x \mid x \text{ hurried in } s\} \cap \{x \mid \exists y[x \text{ ate } y \text{ in } s]\})$	(c)
$[\![\textit{squirrel}]\!]^s \subseteq \{x \mid x \text{ hurried in } s \text{ and } \exists y[x \text{ ate } y \text{ in } s]\}$	$\cap$
$\{x \mid x \text{ is a squirrel in } s\} \subseteq \{x \mid x \text{ hurried in } s \text{ and } \exists y[x \text{ ate } y \text{ in } s]\}$	(c)

(4) For any s, $\llbracket \text{S} \rrbracket^s = 1$ iff

$\llbracket \text{VP} \rrbracket^s \in \llbracket \text{DP} \rrbracket^s$	(g)
$\llbracket \text{VP} \rrbracket^s \in \{A \mid <\llbracket \text{NP} \rrbracket^s, A> \in \llbracket \text{D} \rrbracket^s\}$	(h)
$<\llbracket \text{NP} \rrbracket^s, \llbracket \text{VP}_1 \rrbracket^s> \in \llbracket \text{D} \rrbracket^s$	$\in$
$<\llbracket \text{NP} \rrbracket^s, \llbracket \text{VP}_1 \rrbracket^s> \in \llbracket \textit{no} \rrbracket^s$	(b)
$<\llbracket \text{NP} \rrbracket^s, \llbracket \text{VP}_1 \rrbracket^s> \in \{<A, B> \mid A \cap B = \varnothing\}$	(c)
$\llbracket \text{NP} \rrbracket^s \cap \llbracket \text{VP}_1 \rrbracket^s = \varnothing$	$\in$
$\llbracket \text{N} \rrbracket^s \cap \llbracket \text{VP}_1 \rrbracket^s = \varnothing$	(b)
$\llbracket \textit{ship} \rrbracket^s \cap \llbracket \text{VP}_1 \rrbracket^s = \varnothing$	(b)
$\llbracket \textit{ship} \rrbracket^s \cap \llbracket \text{V}_\text{i} \rrbracket^s = \varnothing$	(b)
$\llbracket \textit{ship} \rrbracket^s \cap \llbracket \textit{sunk}_\text{passive} \rrbracket^s = \varnothing$	(b)
$\llbracket \textit{ship} \rrbracket^s \cap \{x \mid \exists y[<y, x> \in \llbracket \textit{sank} \rrbracket^s]\} = \varnothing$	(c)
$\llbracket \textit{ship} \rrbracket^s \cap \{x \mid \exists y[y \text{ sank } x \text{ in } s]\} = \varnothing$	(c)
$\{x \mid x \text{ is a ship in } s\} \cap \{x \mid \exists y[y \text{ sank } x \text{ in } s]\} = \varnothing$	(c)

(5) i. For any s, $\llbracket \text{DP}_1 \rrbracket^s =$

$\{A \mid <\llbracket \text{NP}_1 \rrbracket^s, A> \in \llbracket \text{D}_1 \rrbracket^s\}$	(h)
$\{A \mid <\llbracket \text{NP}_1 \rrbracket^s, A> \in \llbracket \textit{every} \rrbracket^s\}$	(b)
$\{A \mid <\llbracket \text{NP}_1 \rrbracket^s, A> \in \{<B, C> \mid B \subseteq C\}\}$	(c)
$\{A \mid \llbracket \text{NP}_1 \rrbracket^s \subseteq A\}$	$\in$
$\{A \mid \llbracket \text{N}_{\text{i},1} \rrbracket^s \subseteq A\}$	(b)
$\{A \mid \llbracket \textit{student} \rrbracket^s \subseteq A\}$	(b)

ii. For any s, $\llbracket \text{DP}_2 \rrbracket^s =$

$\{A \mid <\llbracket \text{NP}_2 \rrbracket^s, A> \in \llbracket \text{D}_2 \rrbracket^s\}$	(h)
$\{A \mid <\llbracket \text{NP}_2 \rrbracket^s, A> \in \llbracket \textit{some} \rrbracket^s\}$	(b)
$\{A \mid <\llbracket \text{NP}_2 \rrbracket^s, A> \in \{<B, C> \mid B \cap C \neq \varnothing\}\}$	(c)
$\{A \mid \llbracket \text{NP}_2 \rrbracket^s \cap A \neq \varnothing\}$	$\in$
$\{A \mid \llbracket \text{N}_{\text{i},2} \rrbracket^s \cap A \neq \varnothing\}$	$\in$
$\{A \mid \llbracket \textit{prof} \rrbracket^s \cap A \neq \varnothing\}$	$\in$

iii. For any s, $\llbracket \text{S} \rrbracket^s = 1$ iff

$\llbracket \text{VP} \rrbracket^s \in \llbracket \text{DP}_3 \rrbracket^s$	(g)
$\llbracket \text{VP} \rrbracket^s \in (\llbracket \text{DP}_1 \rrbracket^s \llbracket \text{Conj} \rrbracket^s \llbracket \text{DP}_2 \rrbracket^s)$	(d)
$\llbracket \text{VP} \rrbracket^s \in (\llbracket \text{DP}_1 \rrbracket^s \llbracket \textit{and} \rrbracket^s \llbracket \text{DP}_2 \rrbracket^s)$	(b)
$\llbracket \text{VP} \rrbracket^s \in (\llbracket \text{DP}_1 \rrbracket^s \cap \llbracket \text{DP}_2 \rrbracket^s)$	(c)
$\llbracket \text{VP} \rrbracket^s \in (\llbracket \text{DP}_1 \rrbracket^s \cap \llbracket \text{DP}_2 \rrbracket^s)$	(c)
$\llbracket \text{VP} \rrbracket^s \in (\{A \mid \llbracket \textit{student} \rrbracket^s \subseteq A\} \cap \llbracket \text{DP}_2 \rrbracket^s)$	i.
$\llbracket \text{VP} \rrbracket^s \in (\{A \mid \llbracket \textit{student} \rrbracket^s \subseteq A\} \cap \{A \mid \llbracket \textit{prof} \rrbracket^s \cap A \neq \varnothing\})$	ii.
$\llbracket \text{VP} \rrbracket^s \in \{A \mid \llbracket \textit{student} \rrbracket^s \subseteq A \text{ and } \llbracket \textit{prof} \rrbracket^s \cap A \neq \varnothing\}$	$\cap$
$\llbracket \text{V}_\text{i} \rrbracket^s \in \{A \mid \llbracket \textit{student} \rrbracket^s \subseteq A \text{ and } \llbracket \textit{prof} \rrbracket^s \cap A \neq \varnothing\}$	(b)
$\llbracket \textit{ran} \rrbracket^s \in \{A \mid \llbracket \textit{student} \rrbracket^s \subseteq A \text{ and } \llbracket \textit{prof} \rrbracket^s \cap A \neq \varnothing\}$	(b)
$\llbracket \textit{student} \rrbracket^s \subseteq \llbracket \textit{ran} \rrbracket^s \text{ and } \llbracket \textit{prof} \rrbracket^s \cap \llbracket \textit{ran} \rrbracket^s \neq \varnothing$	$\in$
$\{x \mid x \text{ is a student in } s\} \subseteq \llbracket \textit{ran} \rrbracket^s \text{ and } \llbracket \textit{prof} \rrbracket^s \cap \llbracket \textit{ran} \rrbracket^s \neq \varnothing$	(c)
$\{x \mid x \text{ is a student in } s\} \subseteq \{x \mid x \text{ ran in } s\} \text{ and } \llbracket \textit{prof} \rrbracket^s \cap \llbracket \textit{ran} \rrbracket^s \neq \varnothing$	(c)
$\{x \mid x \text{ is a student in } s\} \subseteq \{x \mid x \text{ ran in } s\}$ and $\{x \mid x \text{ is a prof in } s\} \cap \llbracket \textit{ran} \rrbracket^s \neq \varnothing$	(c)
$\{x \mid x \text{ is a student in } s\} \subseteq \{x \mid x \text{ ran in } s\}$ and $\{x \mid x \text{ is a prof in } s\} \cap \{x \mid x \text{ ran in } s\} \neq \varnothing$	(c)