Question 1   (25%)

Specify a lexicon and derive the meaning of the following sentence:

(1)   John suspects that a student cheated.

Notes:

- Analyze *suspect* using quantification over possible worlds.
- You need to have two interpretations, one for "There is some student about whom John has suspicions," and the other for "John suspects that a student cheated but has no clue on who that student is."

Solution: Let worlds be of type *s*.

Lexicon:

$$
\begin{array}{rrll}
John := & S/(S\backslash NP): & \lambda p.p\,john' :: & \langle\langle e,t\rangle,t\rangle \quad (1) \\
student := & N: & \lambda x\lambda w.student'_w x :: & \langle e,\langle s,t\rangle\rangle \quad (2) \\
suspects := & (S\backslash NP)/S: & \lambda p\lambda x\forall w.Sxw \to pw :: & \langle\langle s,t\rangle,\langle e,t\rangle\rangle \quad (3) \\
cheated := & S\backslash NP: & \lambda x\lambda w.cheated'_w x :: & \langle e,\langle s,t\rangle\rangle \quad (4) \\
a := & S/(S\backslash NP)/N: & \lambda p\lambda q\lambda w\exists x.pxw \wedge qxw :: & \langle\langle e,\langle s,t\rangle\rangle,\langle\langle e,\langle s,t\rangle\rangle,\langle s,t\rangle\rangle\rangle \quad (5) \\
that := & S/S: & \lambda p.p :: & \langle\langle s,t\rangle,\langle s,t\rangle\rangle \quad (6) \\
\end{array}
$$

The lexicon directly affords a derivation for an approximation to the interpretation "John suspects that a student cheated but has no clue on who that student is."
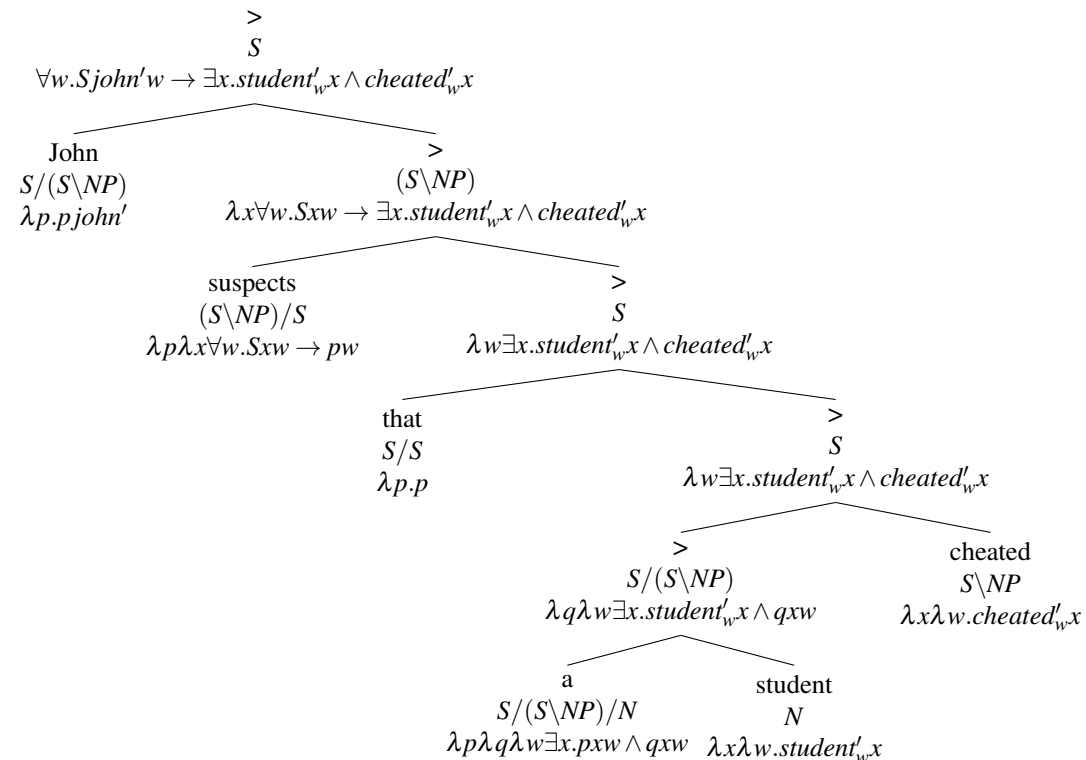
This is only an approximation, because it says that John's suspicion is independent of the actual students in the current world. Studenthood is also relative to John's suspicion worlds. A more adequate rendering would be:

$$\forall w.S\, john'w \to \exists x.student'_{w_0\prime}x \wedge cheated'_w x \tag{7}$$

where $w_0\prime$ represents the world where the utterance is made. In this formula John's suspicions are about the actual students, the students that exist in the utterance world. The machinery that is currently at our disposal is incapable of delivering this interpretation.

As for the interpretation "There is some student about whom John has suspicions," or, more explicitly, "There is some student that John suspects s/he cheated," the logical form would be:

$$\exists x.student'_{w_0\prime}x \wedge \forall w.S\, john'w \to cheated'_w x \tag{8}$$

Again, we are unable to derive this with our current assumptions and tools.

Question 2 (25%)

Specify a lexicon and derive the meaning of the following sentence:

(2)   John peeled the orange on the table.

Notes:

- Ignore the reading where the orange is on the table and concentrate on the pragmatically odd, yet available, interpretation where the event of peeling takes place on the table.

- Use event semantics in your answer. Don't get bothered by time (past tense) for this exercise. Just arrive at:

$$\exists e.peel'(the'orange')e \wedge agent'ej' \wedge located'(the'table')e$$

Solution: Let eventualities be of type *s*.

Lexicon:

$$
\begin{array}{rlrlr}
John := & S/(S\backslash NP): & \lambda p.pj' :: & \langle\langle e,t\rangle,t\rangle & (9)\\
orange := & N: & \lambda x.orange'x :: & \langle e,t\rangle & (10)\\
table := & N: & \lambda x.table'x :: & \langle e,t\rangle & (11)\\
peel := & EP/NP: & \lambda x\lambda e.peeling'xe :: & \langle e,\langle s,t\rangle\rangle & (12)\\
the := & NP/N: & \lambda p.the'p :: & \langle\langle e,t\rangle,e\rangle & (13)\\
on := & (EP\backslash EP)/NP: & \lambda x\lambda p\lambda e.pe \wedge on'xe :: & \langle e,\langle\langle s,t\rangle,\langle s,t\rangle\rangle\rangle & (14)\\
-ed := & (S\backslash NP)/EP: & \lambda p\lambda x.\exists e.pe \wedge agent'ex :: & \langle\langle s,t\rangle,\langle e,t\rangle\rangle & (15)
\end{array}
$$

$$>$$
$$S$$
$$\exists e.peeling'(the'orange')e \wedge on'(the'table')e \wedge agent'ej'$$

John
$$S/(S\backslash NP)$$
$$\lambda p.pj'$$

$$>$$
$$S\backslash NP$$
$$\lambda x.\exists e.peeling'(the'orange')e \wedge on'(the'table')e \wedge agent'ex$$

-ed
$$(S\backslash NP)/EP$$
$$\lambda p\lambda x.\exists e.pe \wedge agent'ex$$

$$<$$
$$EP$$
$$\lambda e.peeling'(the'orange')e \wedge on'(the'table')e$$

$$>$$
$$EP$$
$$\lambda e.peeling'(the'orange')e$$

$$>$$
$$EP\backslash EP$$
$$\lambda p\lambda e.pe \wedge on'(the'table')e$$

peel
$$EP/NP$$
$$\lambda x\lambda e.peeling'xe$$

$$>$$
$$NP$$
$$the'orange'$$

on
$$(EP\backslash EP)/NP$$
$$\lambda x\lambda p\lambda e.pe \wedge on'xe$$

$$>$$
$$NP$$
$$the'table'$$

the
$$NP/N$$
$$\lambda p.the'p$$

orange
$$N$$
$$\lambda x.orange'x$$

the
$$NP/N$$
$$\lambda p.the'p$$

table
$$N$$
$$\lambda x.table'x$$
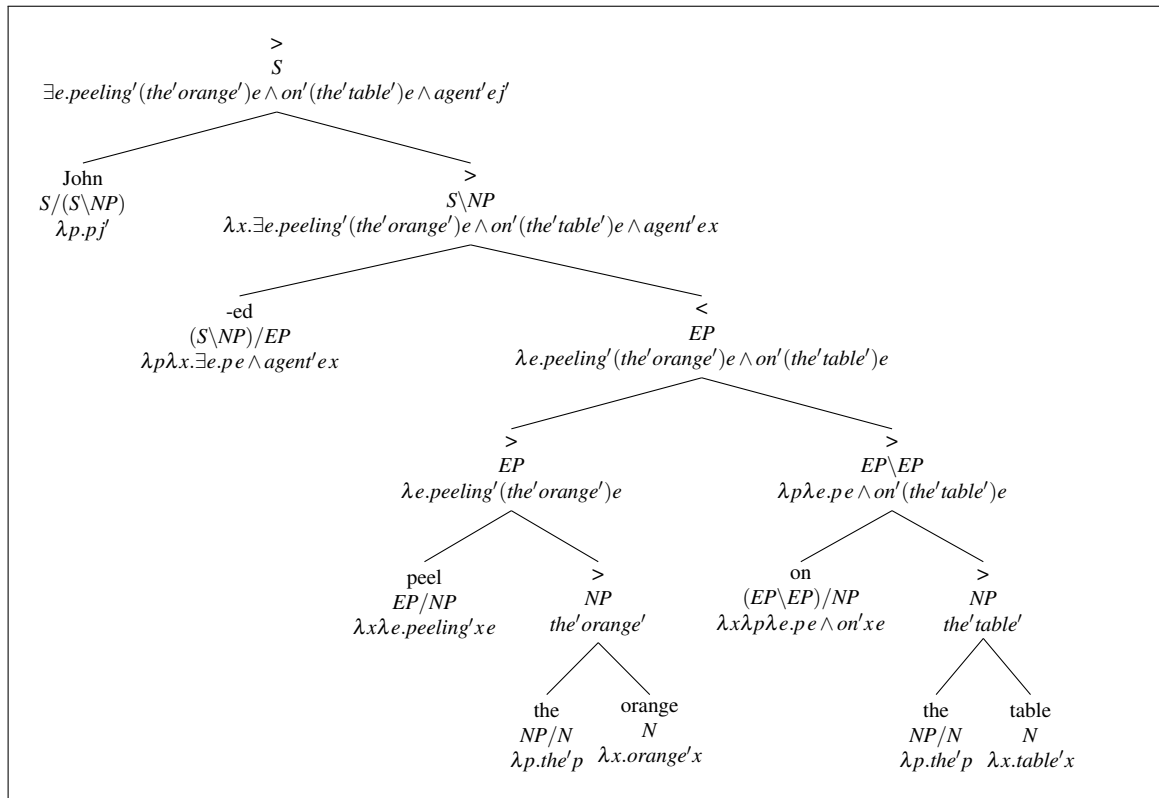
Question 3   (50%)

Specify a lexicon and derive the meaning of the following sentences:

(3)   John admires but Harry loves a famous poet.

(4)   John admires a famous poet but hates a young novelist.