

23-02-24
Friday

Day-3 Analytical Questions

⑧

$3.5 + 4$

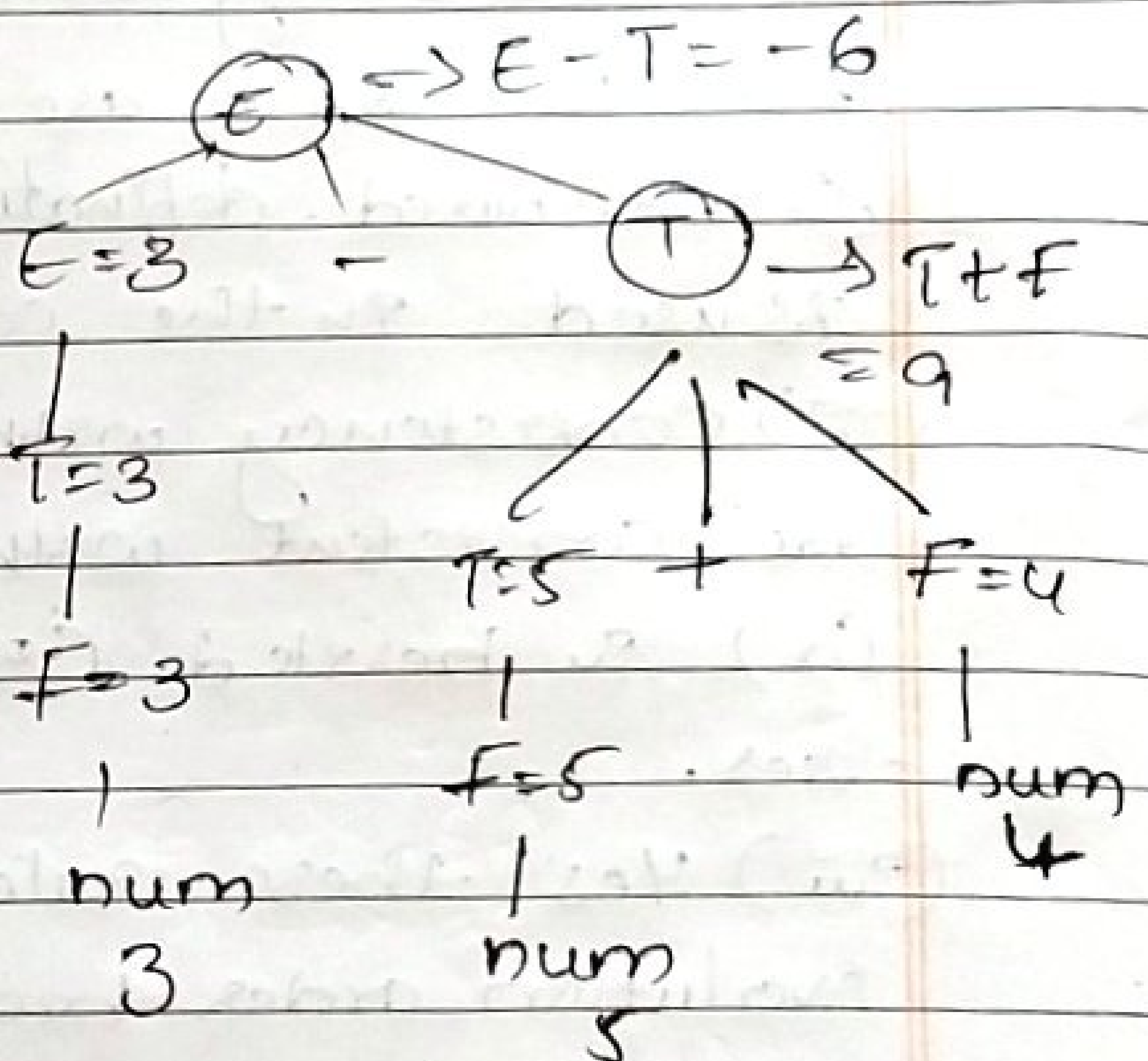
$E \rightarrow E - T$

$E \rightarrow T$

$T \rightarrow T + F$

$T \rightarrow F$

$F \rightarrow \text{num}$



⑦

$(4 + 7.5 * 3) / 2$

$((4) + (7.5) * (3)) / 2$

$E \rightarrow E + T$

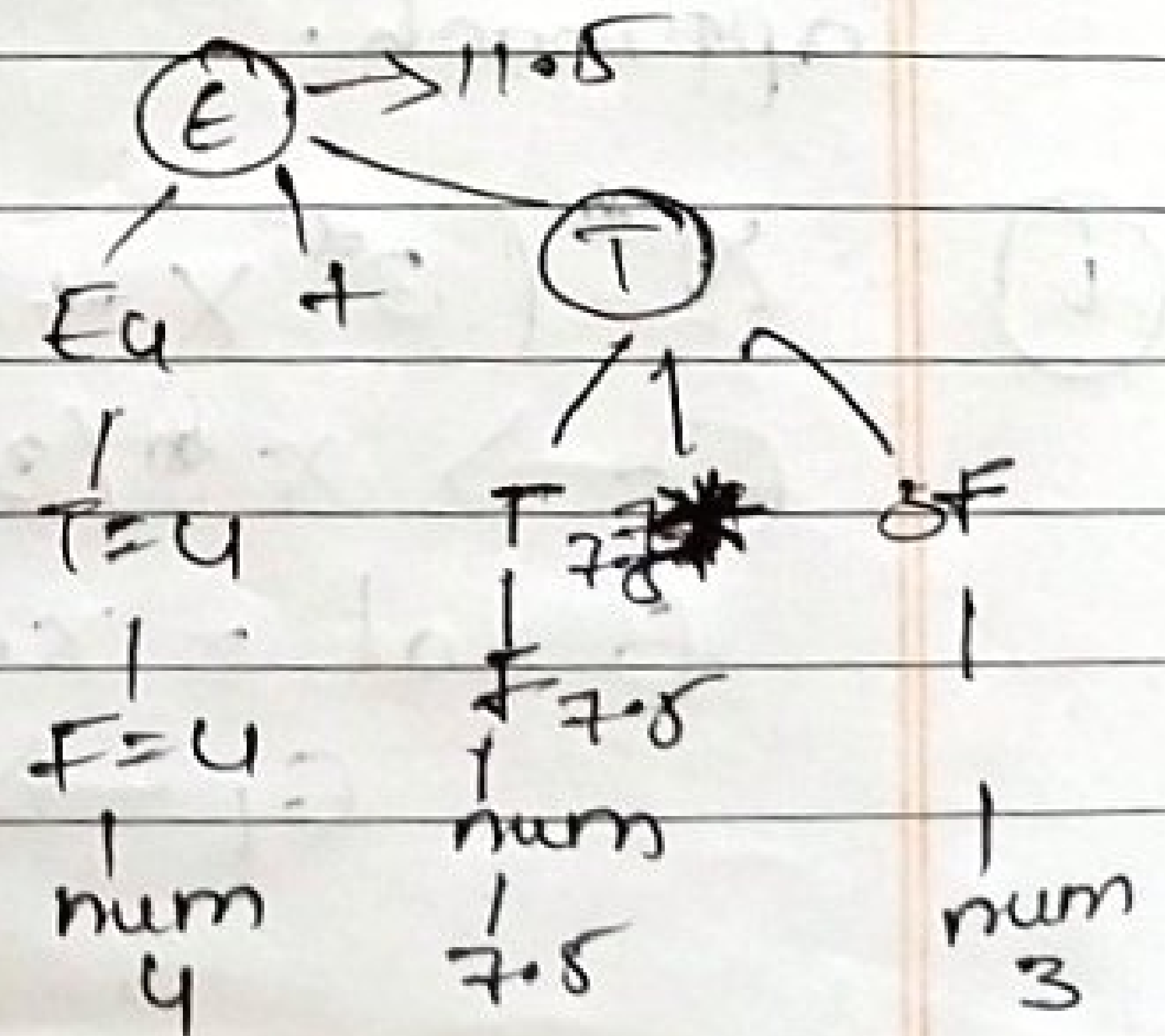
$E \rightarrow T$

$T \rightarrow T * F$

$T \rightarrow F$

$F \rightarrow \text{num}$

$E \rightarrow E T / 2$



⑥ $S \rightarrow T \text{ list}$

$T \rightarrow \text{int}$

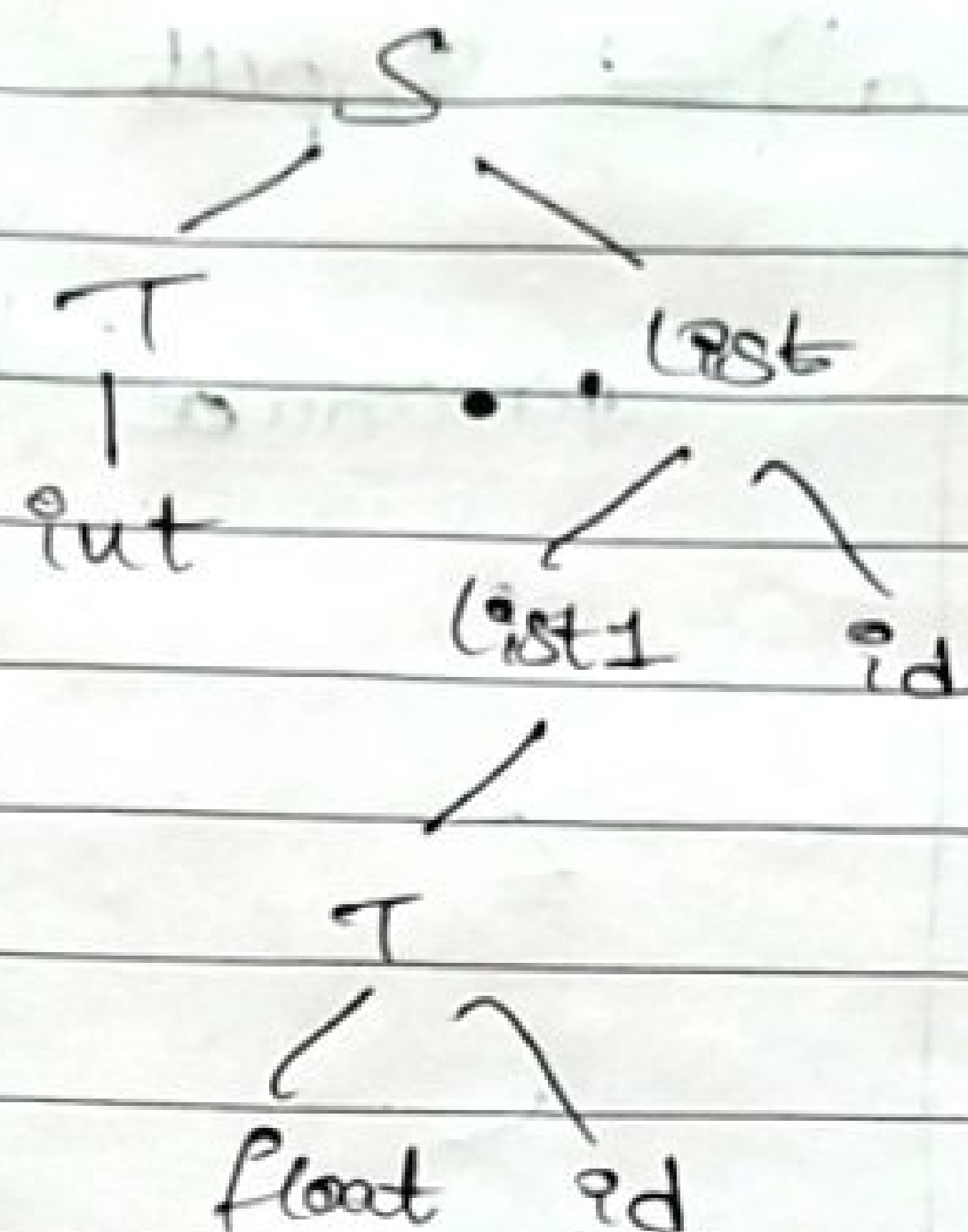
$T \rightarrow \text{float}$

$T \rightarrow \text{char}$

$T \rightarrow \text{double}$

$\text{list} \rightarrow \text{list 1 id}$

$\text{list} \rightarrow \text{id}$



In this graph

- S depends on $T \text{ list}$
- T has four options int, float, char, double
- list has two options list 1, id
- list 1 depends on T and id.

⑤ $\rightarrow A.s = B.i + C.s$

$\rightarrow D.i = A.i + B.s$

(i) consistency with S-attributed definition
No, the rules are not consistently with an S-attributed definition. Synthesized attribute "A.s" is used in the computation of D.i.

(ii) consistency with L-attributed. Yes, the rules are consistent with L-attributed ($A.s, B.s, C.s$)

(or) inherited ($B.i, A.i, D.i$) no circular dependencies.

(iii) Yes these rules are consistent with any evaluation order because they follow a top-down approach.

⑦ $X * (3 * X + X * X);$

$G \rightarrow X * (3 * X + X * X)$ (rule 1)

$E \text{ val} = X.E \mid \text{Var}$ (rules)

$G_1 \rightarrow (3 * X + X * X)$

$$E_{val} = X * (E_2 \text{val} + E_3 \text{val}) \text{ (rules)}$$

$$E_2 \rightarrow 3 * X, E_3 \rightarrow X * X$$

applying rule 4

$$E \cdot \text{val} = X + (E_2 \cdot \text{val} + E_3 \cdot \text{val})$$

$$E_2 \cdot \text{val} = 3 * X \quad E_3 \cdot \text{val} = X * X$$

rule 2:

$$E \cdot \text{val} = X * (E \cdot \text{bval} + E \cdot \text{cval})$$

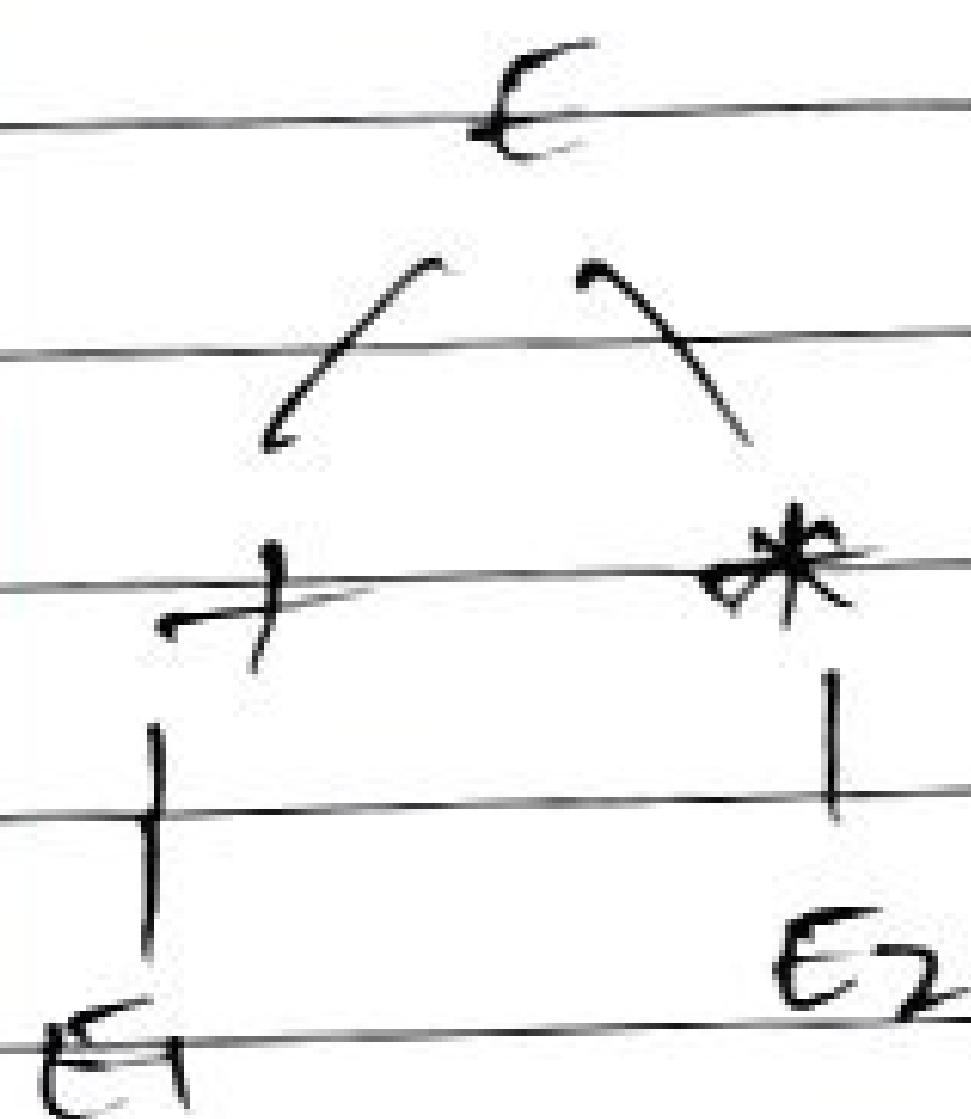
$$E \cdot \text{val} = X * (3 * X + X * X)$$

$$(1) \quad E \rightarrow E_1 + E_2$$

$$E \rightarrow E_1 * E_2$$

(+) depends on both E_1 & E_2

(*) depends on both E_1 & E_2



$$(2) \quad a + b + c - 8$$

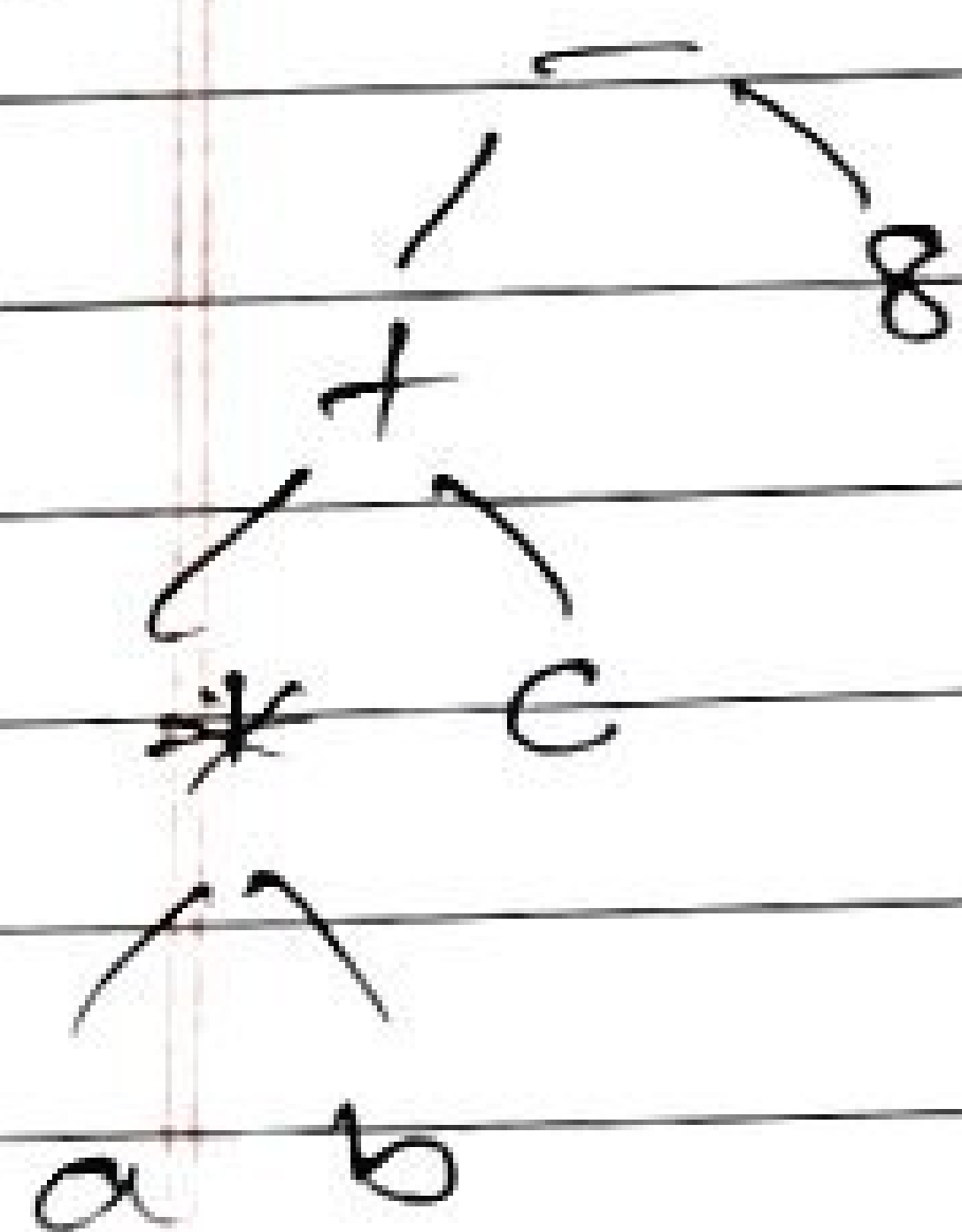
$$E \rightarrow (E_1 + E_2)$$

$$(E_1 - E_3)$$

$$(E_1 * E_4) - E_3$$

$$(E_5 * E_4) - E_3$$

$$(E_5 * E_6) - E_3$$



(a) S-attributed definition

$$S \rightarrow EN : S \cdot \text{val} = E \cdot \text{val}$$

$$E \rightarrow E + T : E \cdot \text{val} = E \cdot \text{val} + T \cdot \text{val}$$

$$E \rightarrow E - T : E \cdot \text{val} = E \cdot \text{val} - T \cdot \text{val}$$

$$E \rightarrow T : E \cdot \text{val} = T \cdot \text{val}$$

$$T \rightarrow T * F : T \cdot \text{val} = T \cdot \text{val} * F \cdot \text{val}$$

$T \rightarrow T / f$ $Tvalue \mid Fvalue$

$T \rightarrow f$ $Tval = fval$

$F \rightarrow (\epsilon)$ $Fval = \epsilon val$

$F \rightarrow digit$ $Fval = digitval.$