Assignment 5

Ans.7. $\Pi_{S.sid, S.sname}\Big(\big(S \ltimes \Pi_{m.sid}(\sigma_{major='CS'}(m))\big) \ltimes \big(t \ltimes \Pi_{b.bookno}(\sigma_{price>10}(b))\big)\Big)$

Ans.9 $\Pi_{(B_1.bookno, B_1.title, B_1.price)}(B_1 - (B \ltimes (T \ltimes \Pi_{m.sid}(\sigma_{major='Math'}(m)))))$

Ans.11. $\Pi_{*}\Big(\big(\Pi_{b_2.*}(b_1 \bowtie_{b_1.price>b_2.price} b_2)\big)te - \big(\Pi_{b_3.*}(te \bowtie_{te.price>b_3.price} b_3)\big)\Big)$

Ans.12 $\Pi_{*}\Big(b \ltimes \Pi_{c.bookno}\big(C \bowtie_{C.citedbookno != te.bookno} \big(\Pi_{b.*} - \big(\Pi_{b_2.*}(b_1 \bowtie_{b_1.price>b_2.price} b_2)\big)\big)te\Big)$

Ans 13. $\Pi_{.*}\Big(S \ltimes \Big(\Pi_{m_1.sid}\big(m_1 \bowtie_{m_1.sid = m_2.sid} m_2\big) \cap \Big(\Pi_{.*}\big(\Pi_{sid}(t) - \Pi_{t_1.sid}\big(b \bowtie_{\substack{b.bookno = t.bookno \\ b.price \le 40}} t\big)\big)\Big)\Big)$

~~Ans 14 $(T \ltimes$~~

Ans 14 $\Big(T \ltimes \Big(\Pi_{m_1.sid}(\sigma_{major='CS'}(m_1)) \cap \Pi_{m_2.sid}(\sigma_{major='Math'}(m_2))\Big) te_1$

$\ltimes_{te_1.sid != te_2.sid \wedge te_1.bookno = te_2.bookno}$

$\Big(T \ltimes \Big(\Pi_{m.sid}(\sigma_{major='CS'}(m)) \cap \Pi_{m_3.sid}(\sigma_{major='Math'}(m_3))\Big)\Big) te_2$

Ans 15. $\Big(\Pi_{T.sid}\big(T \ltimes \Pi_{b.bookno}(\sigma_{price \ge 70}(b))\big) \cap$

$\Pi_{T_1.sid}\big(T_1 \ltimes \Pi_{b_1.bookno}(\sigma_{price < 30}(b_1))\big)\Big)$

$\cup$

$\Big(\Pi_{sid}(S) - \Pi_{sid}(T_2)\Big)$

Ans. 16

$$\Pi_{\substack{temp1.sid,\\ temp2.sid}} \Big(\big(\Pi_{m_1.sid, m_2.sid} \big(m_1 \bowtie_{\substack{m_1.sid \neq m_2.sid \wedge \\ m_1.major = m_2.major}} m_2 \big) \big) \text{temp1} \cap \big(\Pi_{t_1.sid, t_2.sid} \big(t_1 \bowtie_{\substack{t_1.sid \neq t_2.sid \wedge \\ t_1.bookno \neq t_2.bookno}} t_2 \big) \big) \text{temp2} \Big)$$

Ans. 8

$$\Pi_{b_1.bookno, b_1.title, b_1.price} (b_1) \bowtie_{b_1.bookno = temp1.bookno} \Big(\Pi_{temp1.bookno} \Big(\big(\Pi_{c_1.*} \big(c_1 \bowtie_{\substack{c_1.citedbookno = \\ b_2.bookno}} \Pi_{bookno} \sigma_{price<60}(b_2) \big) \big) \bowtie_{\substack{c_1.bookno = c_2.bookno \wedge \\ c_1.citedbookno = c_2.citedbookno}} \big(\Pi_{c_2.*} \big(c_2 \bowtie_{\substack{c_2.citedbookno = \\ b_3.bookno}} \big(\Pi_{bookno} \big(\sigma_{price<60}(b_3) \big) \big) \big) \big) \text{temp1} \Big)$$

Ans.10 $\Pi_{sid, sname, title, price}\Big((\Pi_{sid, sname, title, price}(S_1 \bowtie t_1 \bowtie b_1)) - (\Pi_{sid, sname, title, price}(S_2 \bowtie t_2 \bowtie b_2)\ te \bowtie_{(te.sid = te1.sid \wedge te.price < te.price < te1.price)} (S_3 \bowtie t_3 \bowtie b_3)\ te_1) \Big)$

Ans 2(i) $(\Pi_{E_1.*}(E_1 \times F)) \cup (E_2 - \Pi_{E_2.*}(E_2 \times F))$

(ii)
```
( select e1.*
  from E1 e1 CROSS JOIN F ) UNION
( select e2.*
  from E2 e2 except
( select e2.*
  from E2 e2 CROSS JOIN F )
```

b) i) $\Pi_C((C:true) \times A) \cup ((C:false) - \Pi_C((C:false) \times A))$

(ii)
```
(select t1.C
 from ( select true as C ) t1 CROSS JOIN A )
  UNION
( select false as C except
  select t2.C
  from ( select false as C ) t2 CROSS JOIN A )
```

Ans 3. (a) $\Pi_{A,C}(f \bowtie g)$

(b) $\Pi_A(\Pi_{g.*}(\sigma_{C=y}(g)) \bowtie f))$

Ans 4. $f = f_1 \bowtie_{\substack{f_1.A != f_2.A \wedge \\ f_1.B = f_2.B}} f_2.$

RA:

$(C: false) \times \Pi_{(}(f) \cup \left((C: true) - (C: true) \times \Pi_{(}(f)\right)$

Ans 6. $\Pi_{S,t}(E) \cup$

$\Pi_{E_1.S, E_2.t}(\sigma_{\substack{E_1.T = E_2.S \wedge \\ E_2.T \neq E_1.S}}(E_1 \bowtie E_2)) \cup$

$\Pi_{E_1.S, E_3.T}\left(\sigma_{\substack{E_1.T = E_3.S \wedge \\ E_3.T \neq E_1.S}}\left(\sigma_{\substack{E_1.T = E_2.S \wedge \\ E_2.T \neq E_1.S}}((E_1 \bowtie E_2) \bowtie E_3)\right)\right)$

$\cup$

$\vdots$

$\Pi_{E_1.S, E_n.T}\left(\sigma_{\substack{E_1.T = E_n.S \wedge \\ E_n.T \neq E_1.S}}(((E_1 \bowtie E_2) \bowtie E_3) \cdots \bowtie E_n)\right)$

Ans 5. $(B: false) \times \Pi_{f.B}(\sigma_{A=null}(f)) \cup$

$(B: true) - (B: true) \times \Pi_{f.B}(\sigma_{A \neq null}(f))$