2. (a)
    i. $\Pi_{eid}(\sigma_{aname='boeing'}(Aircraft) \bowtie Certified))$

    ii. R1= $(\sigma_{aname='boeing' \, AND \, Aircraft.aid=Certified.aid}$ $Aircraft \bowtie Certified$

      R2= R1 $\bowtie_{Employees.eid=R1.eid}$Employees

      R3= Π_{ename} R2

    iii. $\Pi_{aid}(Aircraft \bowtie_{crusingrange \, >= \, distance}(\sigma_{from='Bonn' \, AND \, to='Madras'}(Flights)))$

    iv. R1 = $(\sigma_{salary>100000 \, AND \, distance<cruisingrange}$Employees $\bowtie$ Certified $\bowtie$ Aircraft $\bowtie$ Flights)

      R2 = Π_{flno}(R1)

    v. $R1 = \Pi_{ename}(Employees \bowtie Certified \bowtie \sigma_{cruisingrange \, > \, 3000}(Aircraft))$

      $R2 = \Pi_{ename}(Employees \bowtie Certified \bowtie \sigma_{name='boeing'}(Aircraft))$

      $R3 = R1 - R2$

    vi. R1 = $\rho E1 \, (Employees)$

      R2 = $\rho E2 \, (Employees)$

      R3 = $\Pi_{E2.eid} \, (E1 \bowtie_{E1.salary>E2.salary} E2)$

      R4 = $\Pi_{eid}E1$

      R5 = R4-R3

    vii. $R1 = Employees$

      $R2 = \rho_{R2(eid2, \, ename2, \, salary2)}(Employees)$

      $R3 = (R1 \bowtie_{salary< \, salary2}R2)$

      $R4 = R1 - R3$

      $R5 = R1 - R4$

      $R6 = \rho_{R6(eid6, \, ename6, \, salary6)}(R5)$

      $R7 = \Pi_{eid, \, ename, \, salary}(R5 \bowtie_{salary< \, salary6}R6)$

      $R8 = \Pi_{eids}(R5 - R7)$

    viii. No relational algebra because there is no way to use count in RA.

    ix. $R1 = \Pi_{eid, \, aid}((Employees \bowtie Certified) \bowtie Aircraft)$

      $R2 = \rho_{R2(eid2, \, aid2)}(R1)$

      $R3 = \rho_{R3(eid3, \, aid3)}(R1)$

      $R4 = \rho_{R3(eid4, \, aid4)}(R1)$

      $R5 = R1 \bowtie_{aid \, != \, aid2 \, AND \, eid=eid2}R2$

      $R6 = R5 \bowtie_{aid \, != \, aid2 \, AND \, aid2 \, != \, aid3 \, AND \, eid=eid3}R3$

      $R7 = R6 \bowtie_{aid \, != \, aid2 \, AND \, aid2 \, != \, aid3 \, AND \, aid3 \, != \, aid4 \, AND \, eid=eid4}R4$

      $R8 = \Pi_{eid}(R6 - R7)$

    x. No relational algebra because there is no way to use sum in RA