CIS 451/551 Database Processing

TEST 2
2009 December 2

#1. [6 points] Consider relation R for a store selling kites
R = columnName, kiteNum, datePurchased, amountPaid, discount
with functional dependencies
   columnName, kiteNum → datePurchased, amountPaid, discount and
datePurchased → discount
a. What normal form is R in?
b. Normalize R further.

#2. [12 points] Convert the following schema and FD situations into BCNF. Be sure
to list the candidate keys.
   a) R=ABCDE and F={BD→E, D→C, E→A}
   b) R=ABCDEF and F={BD→E, D→C, E→A, A→B, C→F, E→A}

#3. [10 points] Determine whether the following two schedules are conflict-
serializable. If the answer is yes, then check to see if they can be made to follow
strict 2PL (show how the locks would be allocated).
   S1 - T1: W(X), T2: R(X), T3: R(Y), T3: W(Y), T3: R(Z), T3: W(Z), T2: W(X), T1:
   W(Z)
   S2 - T1: W(X), T2: R(X), T3: R(Y), T3: W(Y), T3: R(Z), T3: W(Z), T2: W(X)

#4. [10 points] Insert the values given below into an initially empty B+ tree with
p=4 and pleaf =3.
   35, 10, 7, 23, 4, 3, 16, 8, 25, 2, 30, 5, 28, 6, 40, 31

38 points