1. Assume that:

-X and Y are entity sets

-R is a relation

-X1, X2, X3, X4, X5, and X6 are all the instances of X

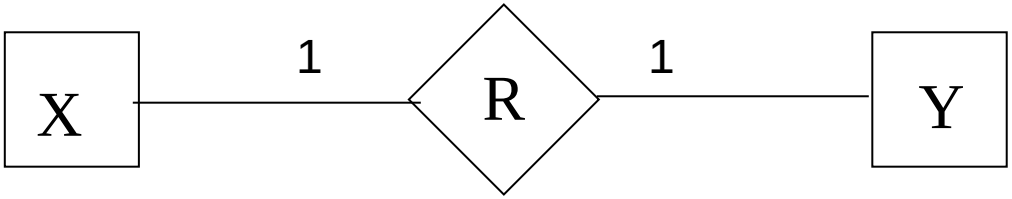
-Y1, Y2, Y3, and Y4 are all the instances of Y

-Y2 is R'ed by X1, Y3 is R'ed by X2

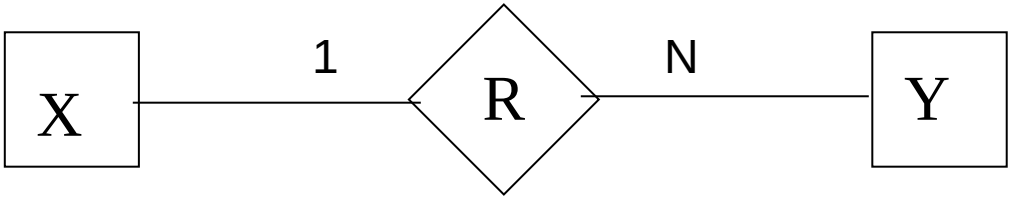
-no other pairs of instances of X and Y are related by R

Which of the ER diagrams on the next slide is/are consistent with the above assumptions, and which isn't/aren't. Be sure to explain your answers. (No credit without valid explanations.)

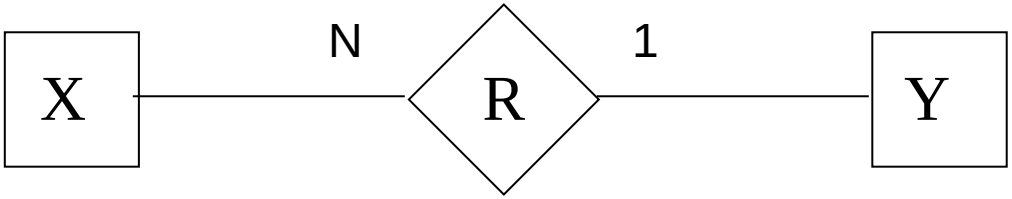
(i)



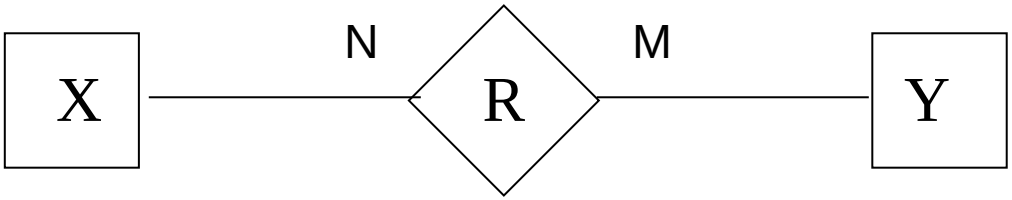
(ii)



(iii)



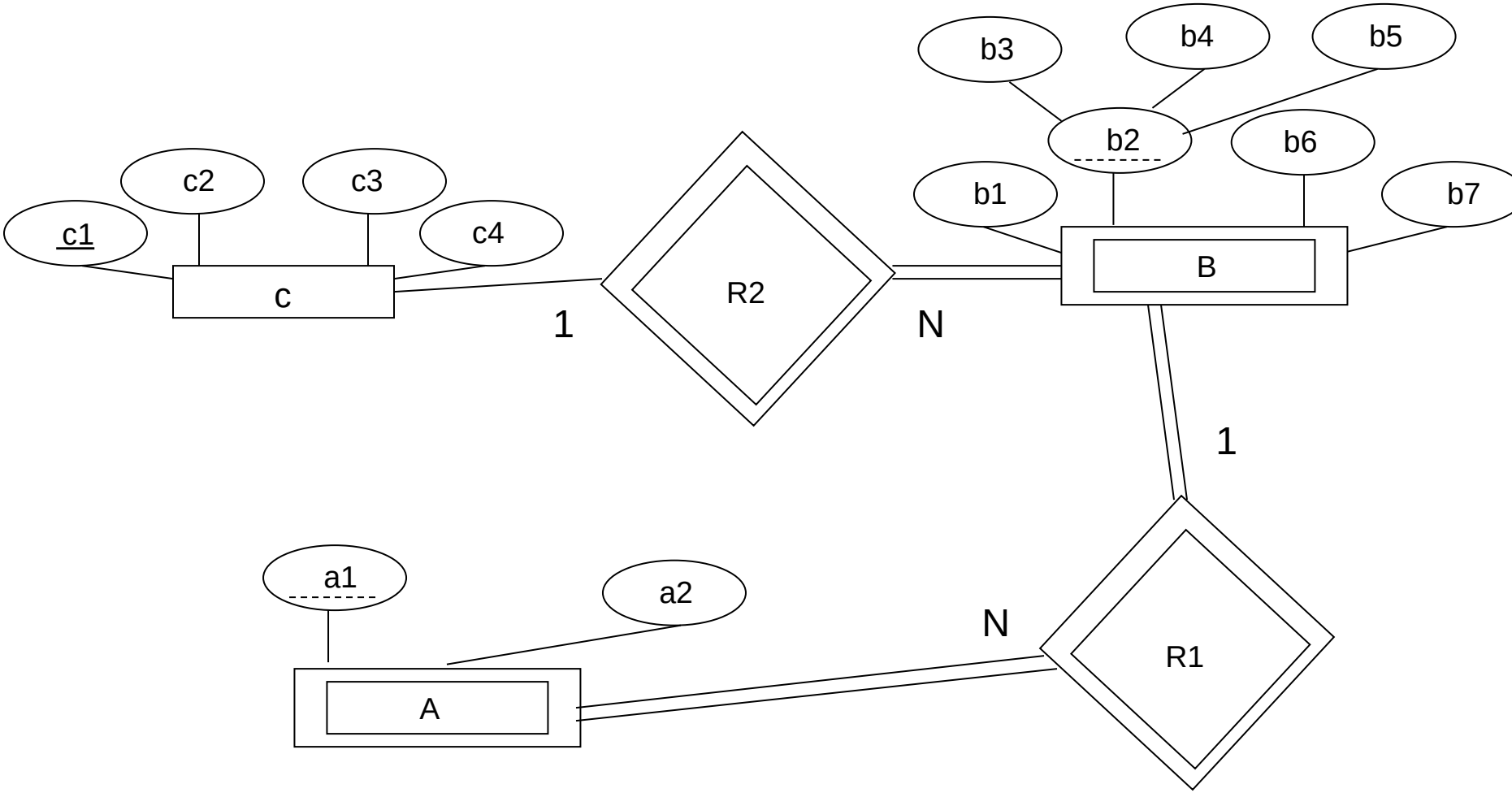
(iv)



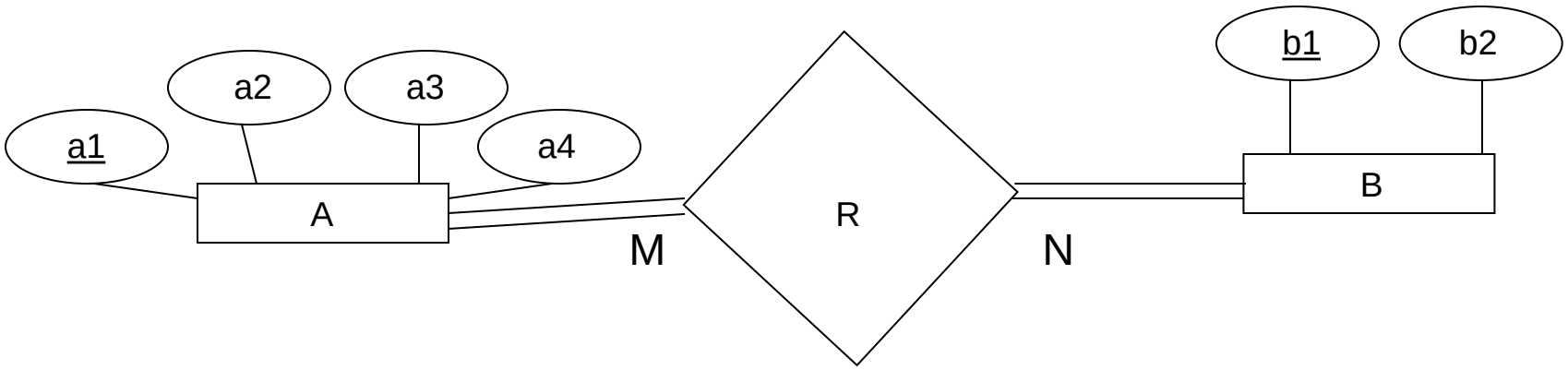
2. Consider the ER diagram on the next slide.

(i) What is the key of entity set A
(ii) What is the key of entity set B
(iii) What is the key of entity set C

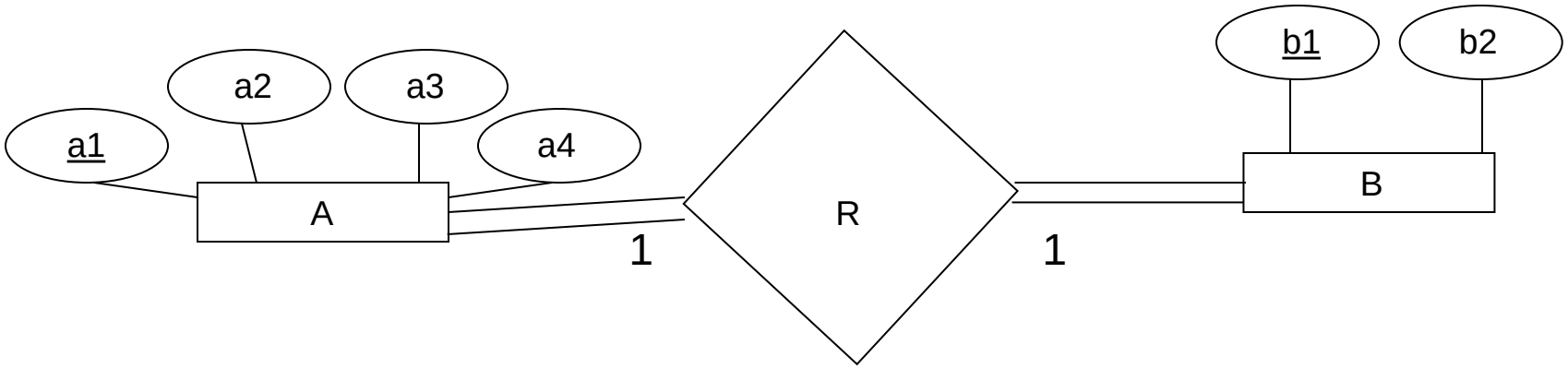
Be sure to explain how you got your answers. (No credit without valid explanations.)


b3
b4
b5
b2
b6
b1
b7
B
c2
c3
c1
c4
c
R2
1
N
1
a1
a2
N
R1
A

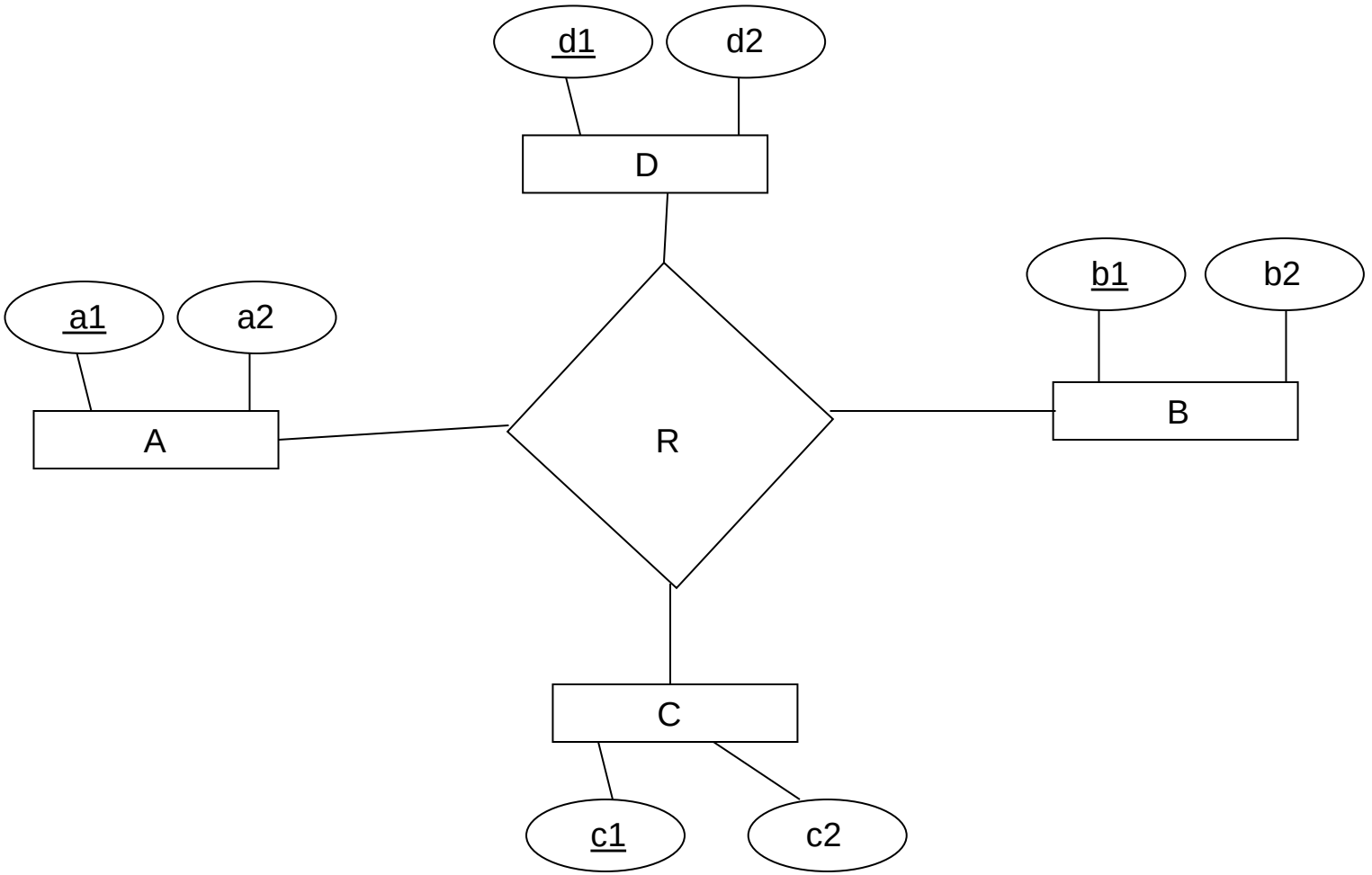
3. Translate the following ER diagram into a minimal storage relational design. Be sure to explain why it's a minimal storage design. (No credit without a valid explanation.)



4. Translate the following ER diagram into a minimal storage relational design. Be sure to explain why it's a minimal storage design. (No credit without a valid explanation.)



5. Translate the following ER diagram into a minimal storage relational design. Be sure to explain why it's a minimal storage design. (No credit without a valid explanation.)



6. Consider the following table schema and functional dependencies:

- Table2(Z, Y, X, W, V, U, T)
- Z->Y
- TY->X
- TY->V
- TY->U
- X->W
- W->V

Find a key for Table2 and show that it’s actually a key. (No credit otherwise)

7. Consider the following table schema and functional dependencies:

- Table4(F, G, H, I, J, K)
- F->G
- G->H
- J->I

Normalize Table4. (Note that there are no redundant left hand side attributes and no redundant functional dependencies.)