

1. (2) Consider the relation $R(a,b,c)$ with FD: $ab \rightarrow c$ and MVD: $c \twoheadrightarrow a$.

Which of the following are 4NF decompositions of R ? Select **one** option.

- (a) $R_1(a, b)$ $R_2(b,c)$
- (b) $R_1(a,c)$, $R_2(a,b)$
- (c) $R_1(a,c)$, $R_2(b,c)$
- (d) all options are correct

2. (4) Consider the relation $R(a,b,c,d)$ with functional dependencies and MVDs:

$a \rightarrow bc$, $c \twoheadrightarrow ab$.

Which of the following are 4NF decompositions of R ? Select **all** options.

- (a) $R_1(a,c)$, $R_2(b,c,d)$
- (b) $R_1(a,d)$, $R_2(a,b,c)$
- (c) $R_1(c,d)$, $R_2(a,b,c)$
- (d) $R_1(b,d)$, $R_2(a,b,c)$

3. (4) Consider the relation $R(a,b,c,d)$ with functional dependencies and MVDs:

$a \rightarrow b$, $c \rightarrow d$, $b \twoheadrightarrow c$.

Which of the following are 4NF decompositions of R ? Select **all** options.

- (a) $R_1(a, b)$ $R_2(c, d)$, $R_3(a, c)$
- (b) $R_1(a, b)$ $R_2(b, c)$ $R_3(a, d)$
- (c) $R_1(a, c)$ $R_2(b, c, d)$
- (d) $R_1(a, b)$ $R_2(a, c)$ $R_3(b, d)$