Qn3a.

F = {ABC → E, BD → A, CG → B}

Since CG → B

By Axiom of Augmentation,

CDG → BD ------------- (1)

By Axiom of Transitivity,

Since (1) and BD→A,

CDG → A ---------- (2)

By Axiom of Reflexivity and Transitivity,

From (1),

CDG → BD → B ---------- (3)

By Axiom of Reflexivity,

CDG → C ----------- (4)

CDGB → AB

From (2), (3), applying union property (proven in lecture notes),

CDG → AB ------------- (5)

Applying the union property on (4) and (5),

CDG → ABC ------------ (6)

By Axiom of Transitivity,

From (6) and ABC → E,

CDG → E (proven)

Qn3b.

Qn3c

Keys(R) = {CDG}