Question 1  
A) F = {A->BC, B->D, D->E, C->A}  
 1) Augmentation: {B->D} -> {BC->CD}  
 Augmentation: {D->E} -> {CD->CE}  
 Augmentation: {C->A} -> {CE->AE}  
 Transitivity: BC->CD->CE->AE  
 BC->AE  
 2) Decomposition: {A->BC} -> {A->B}  
 Transitivity: {B->D} -> {A->D}  
 Transitivity: {D->E} -> {A->E}  
 Union: {A->D} + {A->E} -> {A->ED}  
 A->ED  
 3) Unable to be logically implied. The only FD with C on the right-hand side requires A, and the only FD with A on the right-hand side requires C. We require either A or C in the left-hand side of the provided FD.

B) F = {A->BC, CD->E, E->F, B->D}  
 1) Candidate Key  
 Augmentation: {A->BC} -> {AC->BC}

Trivial: {A->A} -> {AC->ABC}

Augmentation: {B->D} -> {AC->ABCD}  
 Augmentation: {D->E} -> {AC->ABCDE}  
 Augmentation: {E->F} -> {AC->ABCDEF}  
 2) Candidate Key  
 Augmentation: {A->BC} -> {AD->BCD}

Trivial: {A->A} -> {AC->ABCD}  
 Augmentation: {D->E} -> {AC->ABCDE}  
 Augmentation: {E->F} -> {AC->ABCDEF}

3) Candidate Key  
 Augmentation: {A->BC} -> {A->BC}

Trivial: {A->A} -> {A->ABC}  
 Augmentation: {B->D} -> {A->ABCD}  
 Augmentation: {D->E} -> {A->ABCDE}  
 Augmentation: {E->F} -> {A->ABCDEF}

C) F = {A->B, AB->C, CD->E, E->FG}  
 1) A->C  
 Start: A->B  
 Augmentation: {A->A} -> {A->AB}  
 Transitivity: {A->AB} + {AB->C} -> {A->C}

2) CD->FG  
 Transitivity: {CD->E} + {E->FG} -> {CD->FG}

3) AD->E  
 Start: A->B  
 Augmentation: {A->A} -> {A->AB}  
 Transitivity: {A->AB} + {AB->C} -> {A->C}  
 Augmentation: {A->C} -> {AD->CD}  
 Transitivity: {AD->CD} + {CD->E} -> {AD->E}  
 4) AD->FG  
 Transitivity: {AD->E} + {E->FG} -> {AD->FG}

5) AD->ABCDEFG  
 Augmentation: {A->B} -> {AD->ABD}  
 Augmentation: {AB->C} -> {AD->ABCD}  
 Augmentation: {CD->E} -> {AD->ABCDE}  
 Augmentation: {E->FG} -> {AD->ABCDEFG}

Question 2  
A) F = {X->Y, YZ->W, W->Z}, G = {X->YZ, Y->W, W->Z, Z->Y}  
 1)