

1. There are two paths from A to K.

Points of evidence: <G, E>.

Path 1: A 🡪 D 🡪 G 🡪 K.

G is an evidence which is in serial connection, therefore the path is blocked at G.

Path 2: A 🡪 D 🡪 H 🡪 K.

D and H are both in serial connection but none of them are in evidence. Hence, the path is not blocked.

Since, path 2 is not blocked from A to K for <G, E>, A and K are not d-separated by G,E.

1. There are two paths from D to C.

Point of evidence: <F>.

Path 1: D 🡪 H 🡪 E 🡨 C

E is in head-to-head converging connection but neither E or its children are part of <F>, hence the path is blocked.

Path 2: D 🡪 G 🡪 K 🡨 H 🡪 E 🡨 C

Path 2 is blocked a E and K because they are not part of <F> and nor do their children. Therefore, the path is blocked.

Since all paths are blocked from D to C given <F>, D and C are d-separated by <F>.

1. There are two paths from A to C.

Point of evidence: <I>.

Path 1: A 🡪 D 🡪 H 🡪 E🡨 C

D, H do not have any connection with <I>. E itself is not in <I> but I is E’s descendent. Therefore, the path is not blocked.

Path 2: A 🡪 D 🡪 G 🡪 K 🡨 H 🡪 E 🡨 C

K is in head-to-head diverging connection but it has no evidence relation and neither does its children. Therefore, path is blocked at K.

Since, path 1 is not blocked from A to C for given <I>. A and C are not d-separated by <I>.

1. We have two paths from A to M.

Point of evidence =φ = <>

Path 1: A 🡪 D 🡪 H 🡪 E 🡪 I 🡨 F 🡪 J 🡪H

I is in head-to-head relationship but it is not part of <>. I’s children are not part of <> as well therefore path is blocked at I.

Path 2: A 🡪 D 🡪 G 🡪 K 🡨 H 🡪 E 🡪 I 🡨 F 🡪 J 🡪 M

K is not in head-to-head relationship but k is not part of <>. K’s children are not part of <> as well. From path 1, I is also in head-to-head relationship. So, the path is blocked at I and K.

Since, all the paths are blocked from A to M given empty-set, A and M are d-separated by empty-set.