

Figure 1: Directed graphical model.

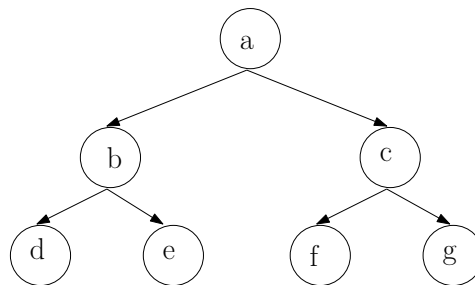


Figure 2: Directed Tree.

1. Given the graphical model in Figure 1, which of the following conditional independence statements are correct?
 - (a) $a \perp\!\!\!\perp f$
 - (b) $a \perp\!\!\!\perp g$
 - (c) $b \perp\!\!\!\perp i | f$
 - (d) $d \perp\!\!\!\perp j | g, h$
 - (e) $i \perp\!\!\!\perp b | h$
 - (f) $j \perp\!\!\!\perp d$
 - (g) $i \perp\!\!\!\perp c | h, f$
2. Let us consider the following directed graph in Figure 2.
 - (a) Find the undirected graph that encodes the same conditional independences as the directed graph.
 - (b) Find the joint-tree of the undirected graph.
 - (c) What is the joint probability distribution that encodes these conditional independences.