**Question 1.** For part 1 see Figure 1 below.

Forward edges are $(f, l)$, $(a, j)$.

Backward edges are $(i, c)$, $(n, f)$, $(b, g)$.

Cross edges are $(i, d)$, $(m, i)$, $(f, c)$, $(n, l)$, $(j, e)$, $(k, b)$.

The strongly connected components are $\{a\}$, $\{g, b, k, o\}$, $\{j\}$, $\{f, n, e\}$, $\{l\}$, $\{c, i, m, h\}$, $\{d\}$.

**Question 2.** See Figure 2 below.

**Question 3.** For part 1 see Figure 3 below.

For part 2 the $f$ array is $f[a] = 1$, $f[b] = 11$, $f[c] = 2$, $f[d] = 2$, $f[e] = 2$, $f[f] = 11$, $f[g] = 5$, $f[h] = 1$, $f[i] = 1$, $f[j] = 5$, $f[k] = 11$, $f[l] = 5$, $f[m] = 8$, $f[n] = 11$, $f[o] = 11$.

For part 3 the bridges are undirected edges $(m, j)$, $(g, d)$, $(d, a)$, $(k, h)$.

For part 4 the articulation points are $d$, $j$, $g$, $a$, $k$, $h$.

**Question 4.** See Figure 4 below.

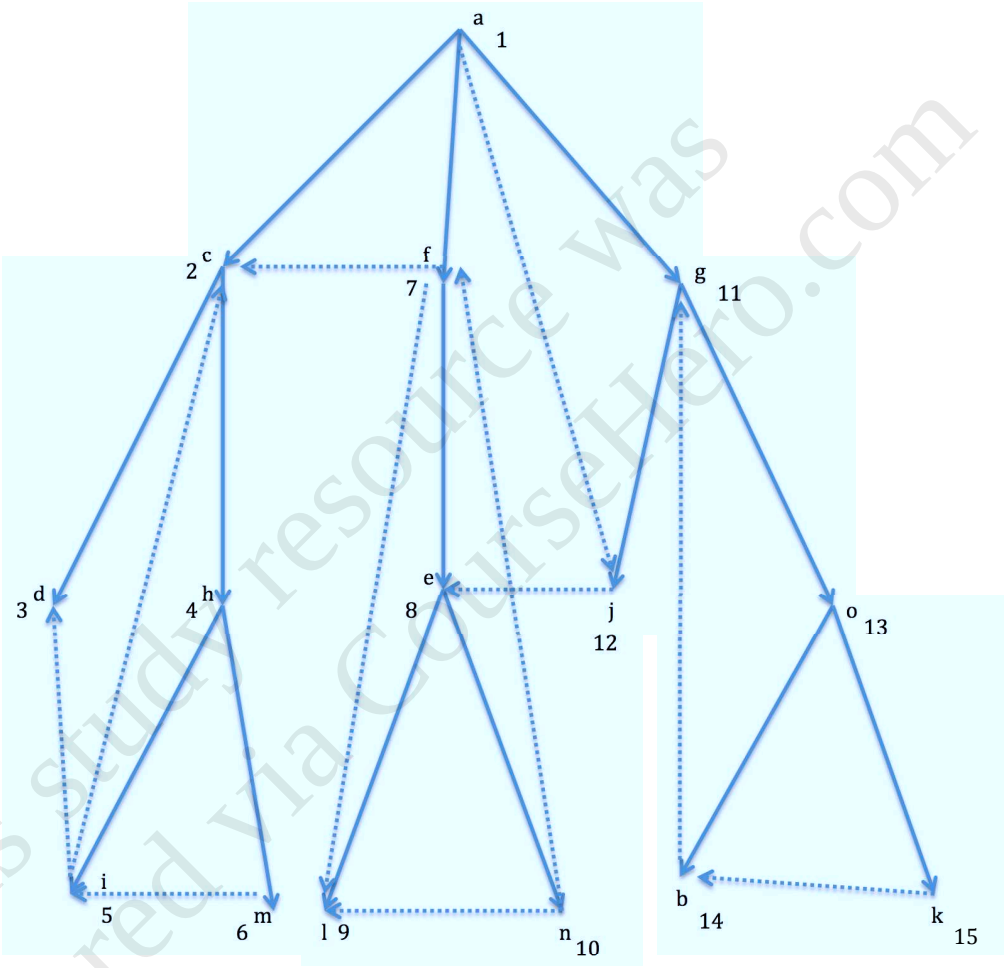


Figure 1: Depth-first search tree for Question 1

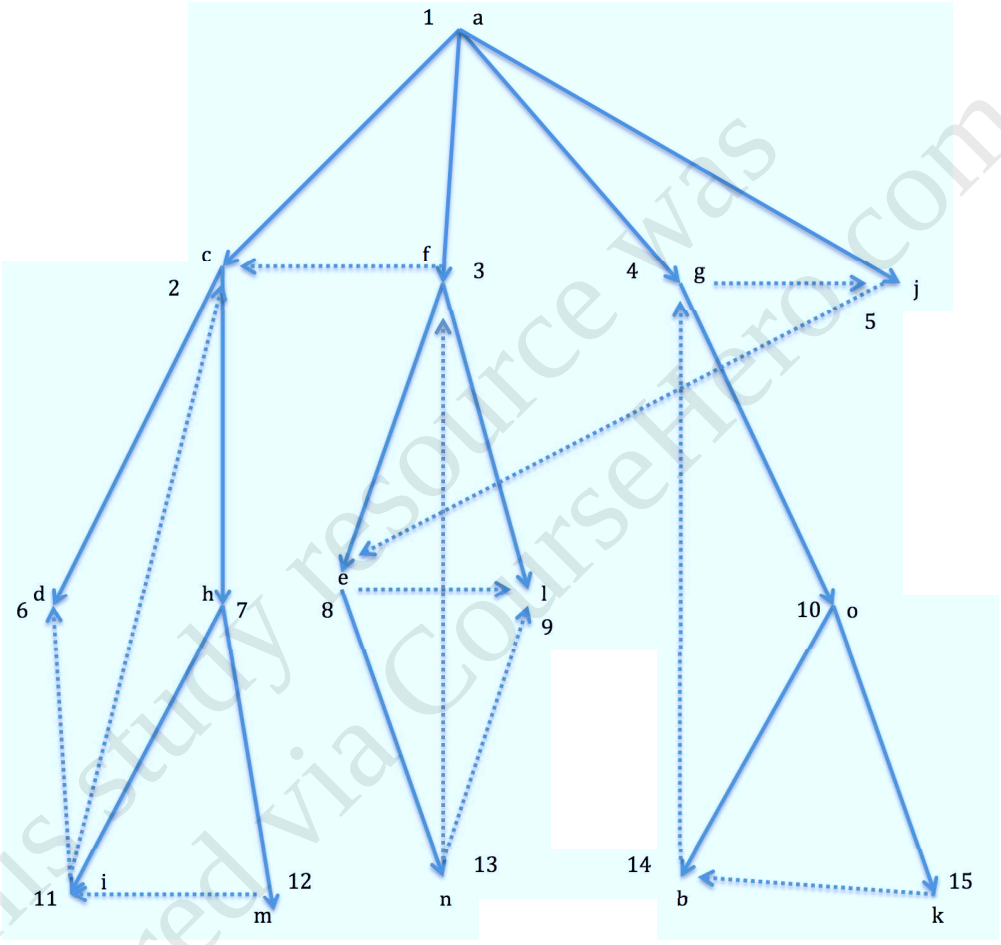


Figure 2: Breadth-first search tree for Question 2

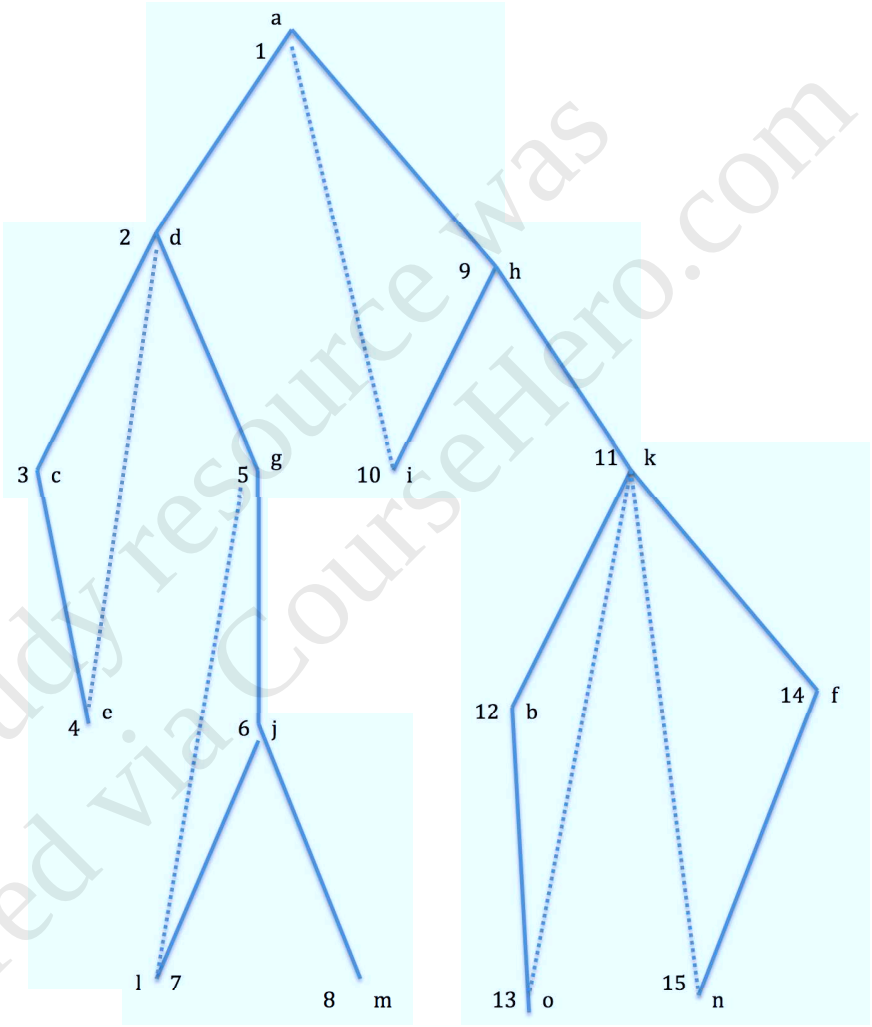


Figure 3: Depth-first search tree for Question 3

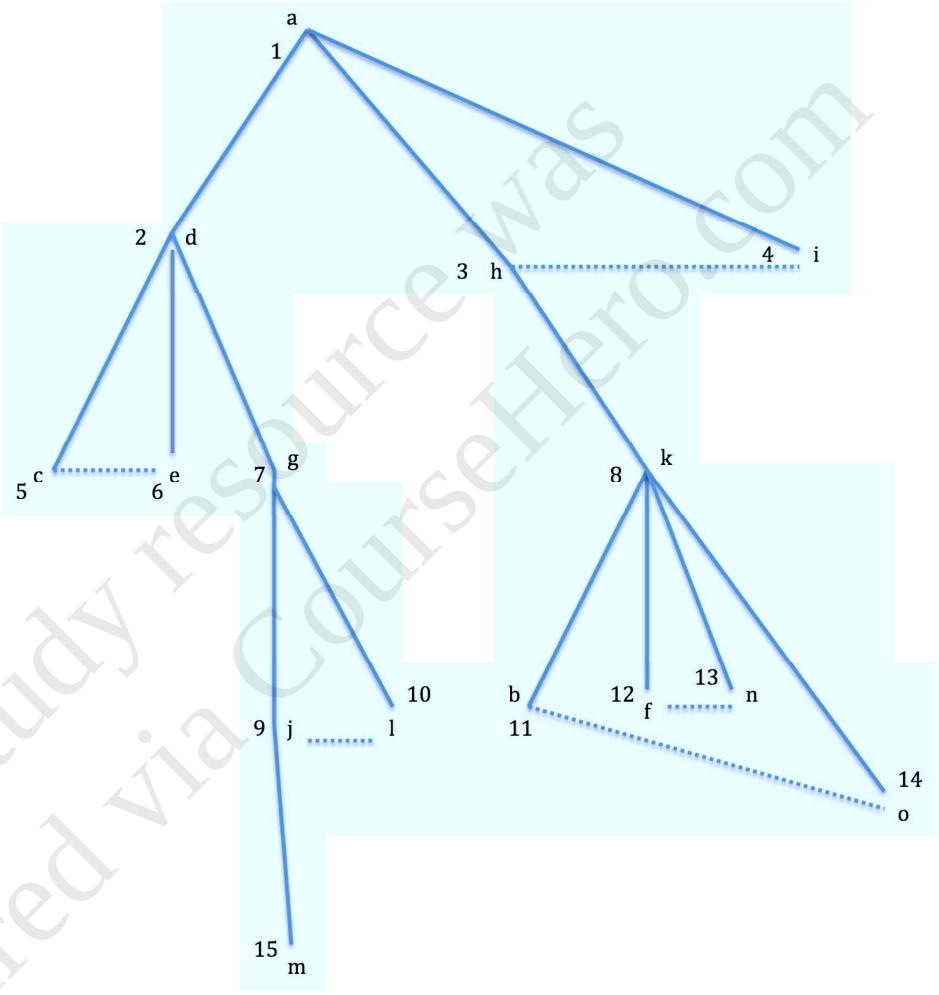


Figure 4: Breadth-first search tree for Question 4