

Note I interpret 'multiple choice' loosely. The key is that the answer should be one of finite number of choices. It should be non-ambiguous.

## Example questions on sorting

### Question 1

Give the array that results after the first 4 exchanges when selection sorting the following array:

90 21 52 55 22 59 47 78 57 41

### Question 2

True or false: The number of compares to selection sort a sorted array of N distinct keys is approximately N.

## Example questions on graph

### Question 1

Consider the adjacency-lists representation of a graph with 10 vertices and 10 edges:

A: E B F

B: C G A

C: G D B

D: G C

E: A

F: A

G: C H D B

H: G

I: J

J: I

- 1) Run depth-first search (using the adjacency-lists representation) from vertex A. Give the sequence in which depth-first search first visits (marks) the vertices. This is known as the preorder. [Ans: AEBCGHDF]
- 2) Run breadth-first search (using the adjacency-lists representation) from vertex A. Give the sequence in which the vertices are dequeued from the FIFO queue. [Ans: AEBFCGDH]
- 3) Compute the connected components of the graph using the depth-first search algorithm. Give the sequence of values in the id[] array for the vertices A through J. Use 0, 1, 2, ... to represent vertex A, B, C, ...