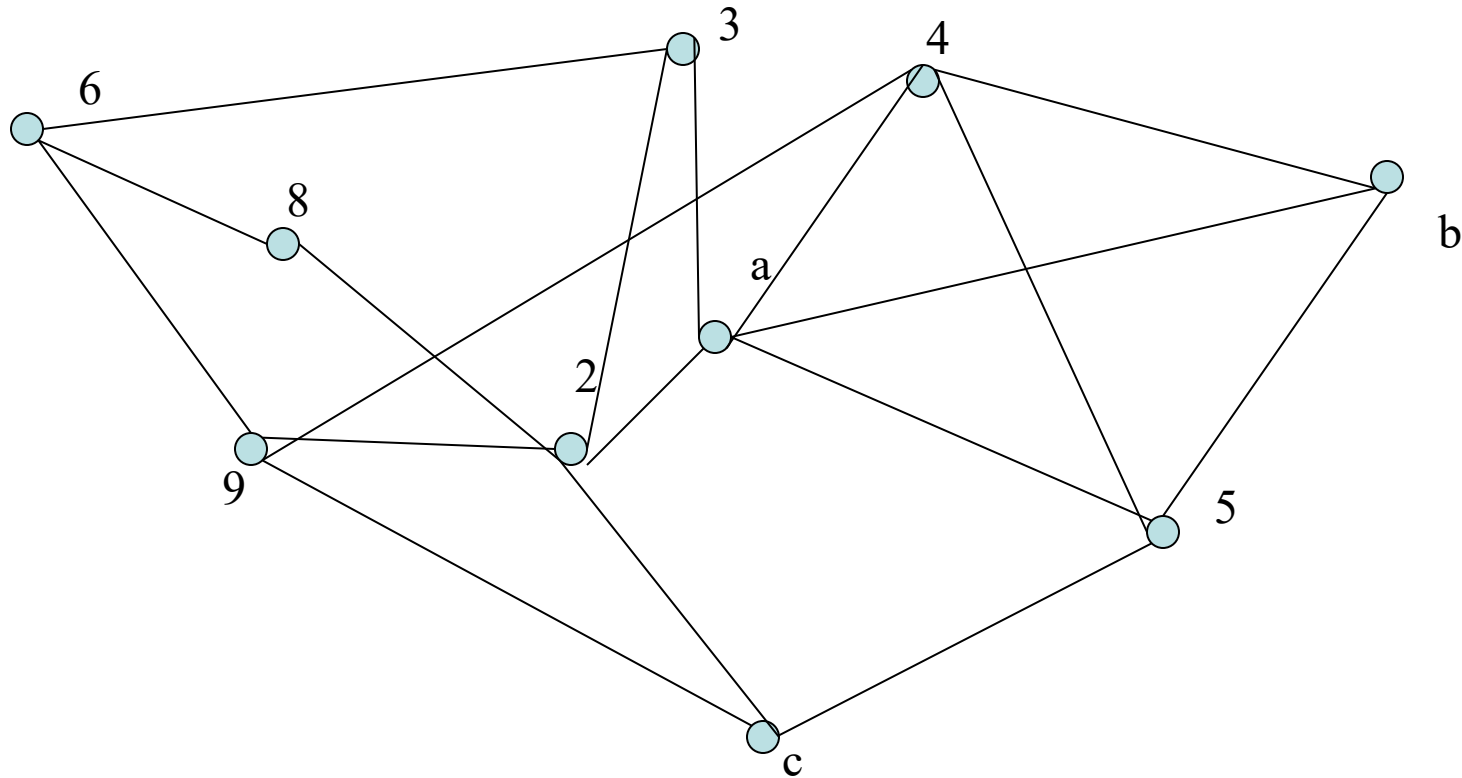


1. For minimum vertex cover problem in the following graph give

greedy solution = nodes _____

2-VC solution = nodes _____

Optimal solution = nodes _____



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2. For the following graph, find

Optimal TSP tour _____

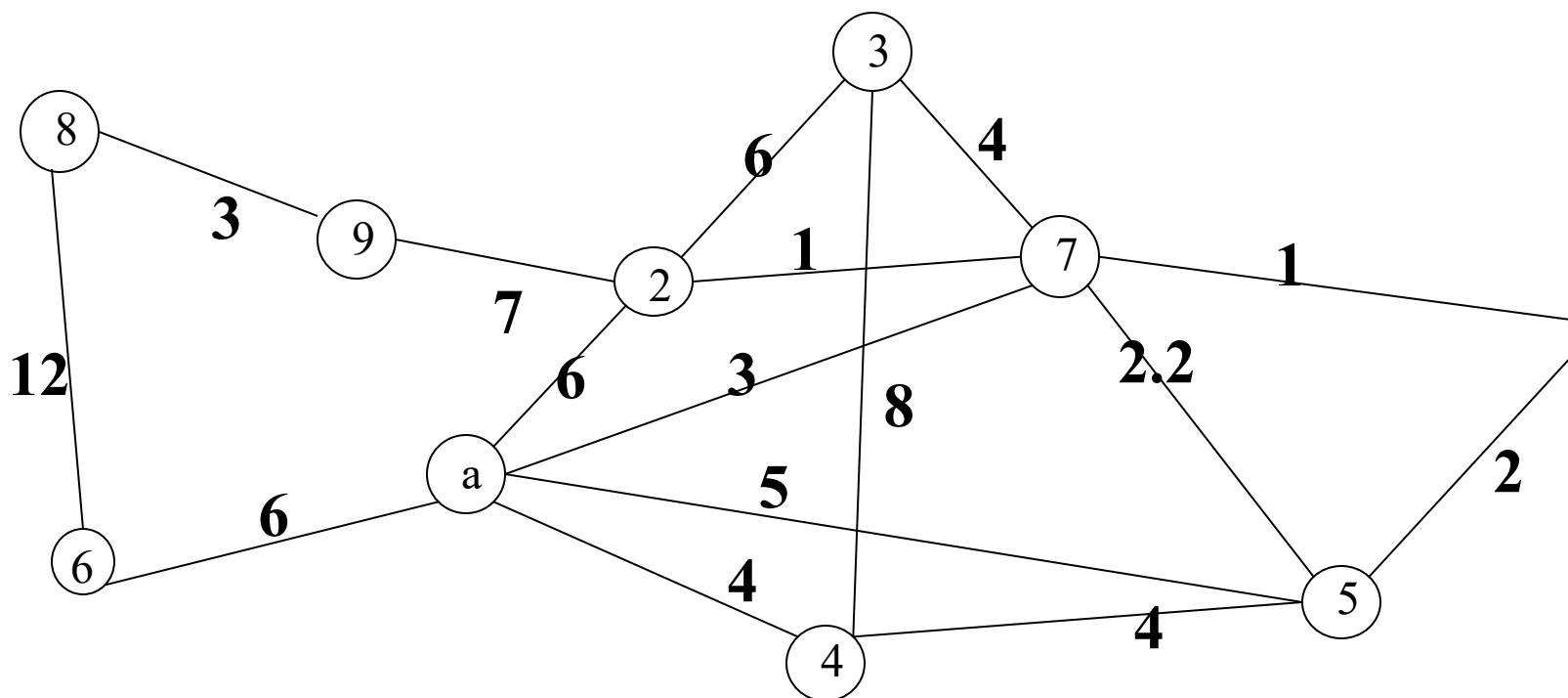
length = _____

Double MST tour _____

length = _____

MST-heuristic tour (with shortcuts) _____ length = _____

The error of the MST-heuristic is _____%



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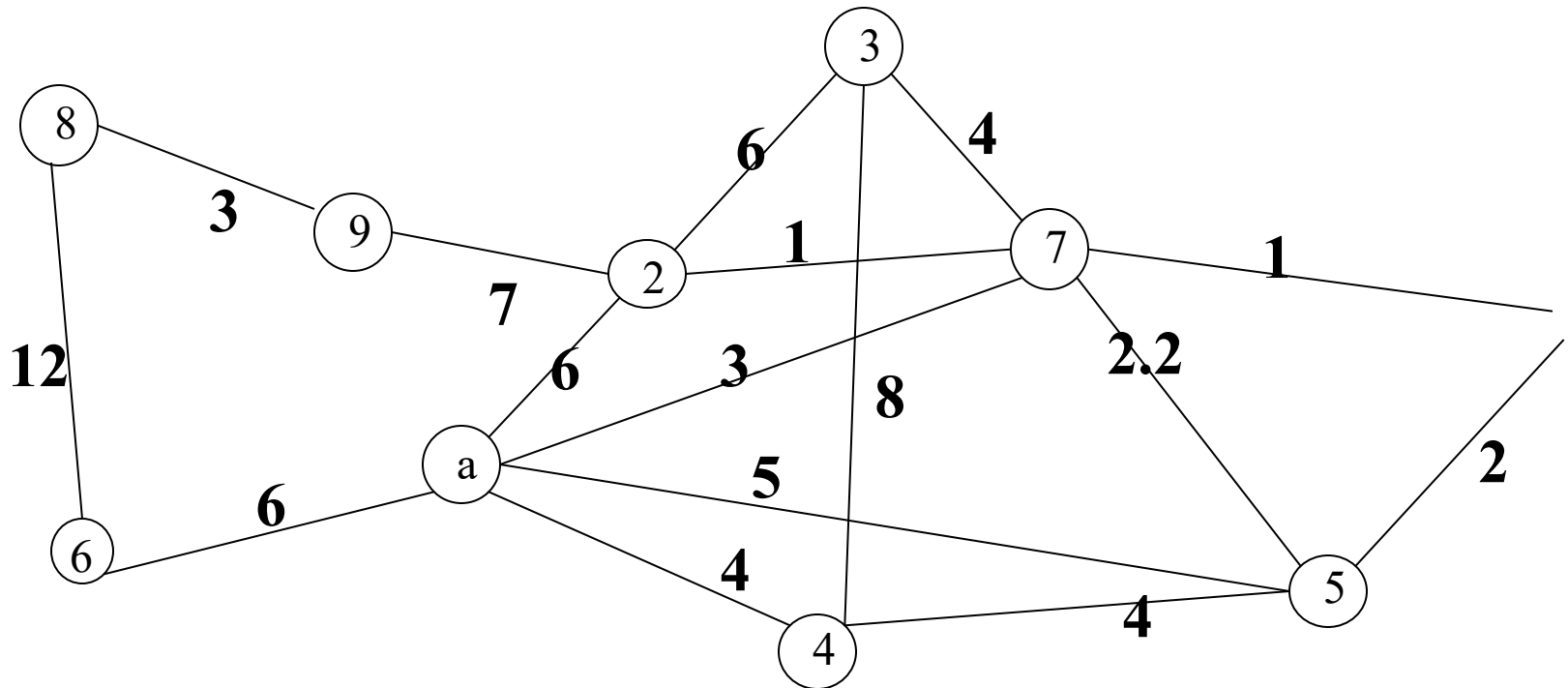
3. For the following graph, find

Christofides heuristic matching _____ length = _____

MST+matching tour _____ length = _____

Christofides heuristic tour (w/shorts) _____ length = _____

The error of the Christofides heuristic is _____%



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4 . In the rectilinear metric for points given below find

- The minimum Steiner tree (bold), its length is _____
- The minimum spanning tree (dashed), its length is _____
- the approximation ratio of the MST heuristic in this case is _____
- Approximation error in % _____

