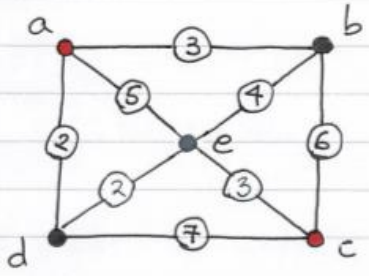
CMPU2012

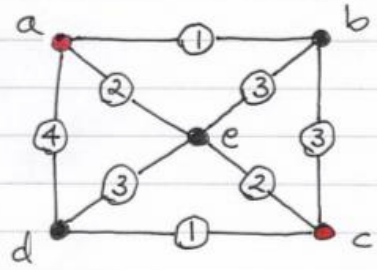
Problem Sheet 13

For each of the following weighted graphs find the shortest path between the two vertices marked in red, using Dijkstra's Algorithm.

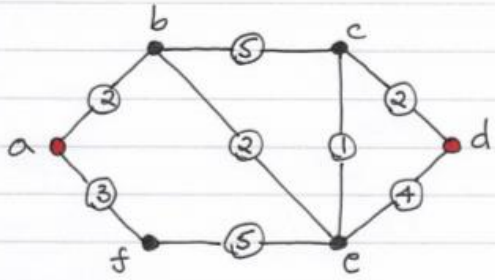
1.



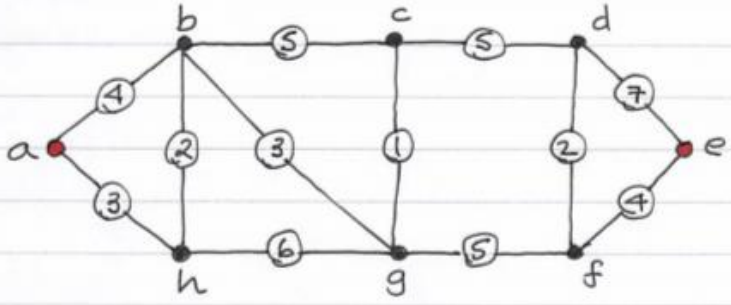
2.



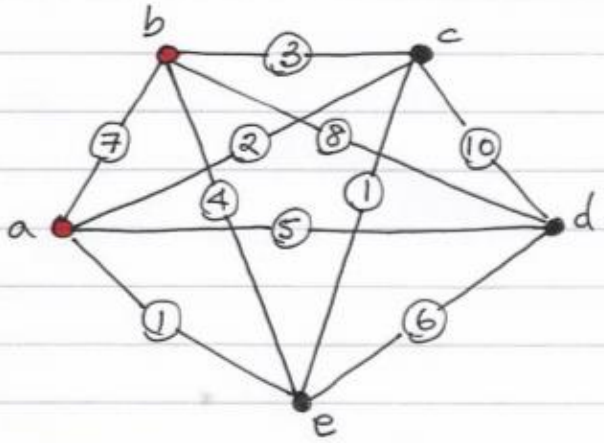
3.



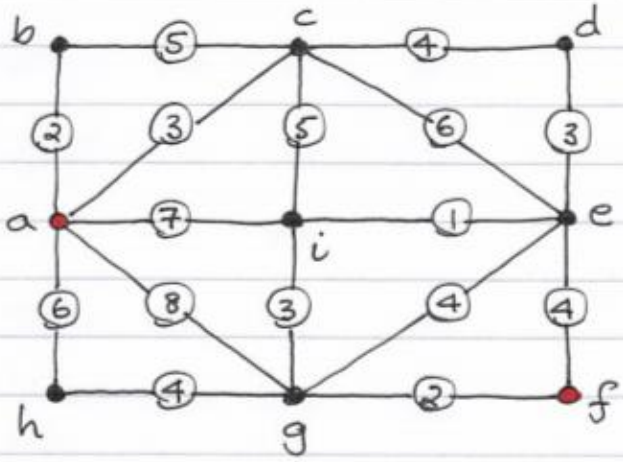
4.



5.

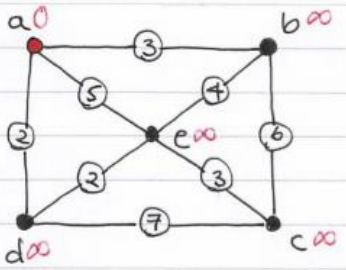


6.

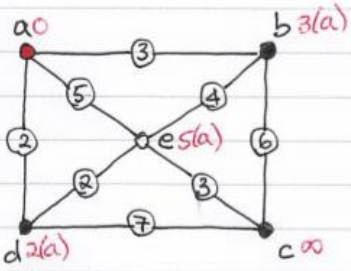


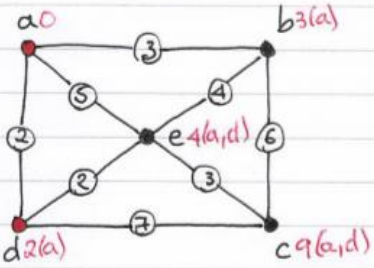
Answers

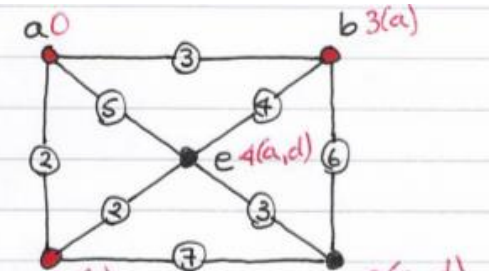
1.

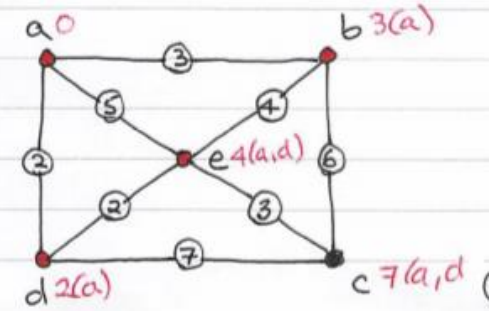


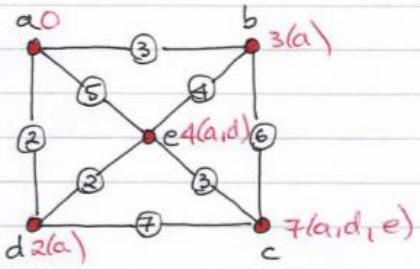
Note: Vertices in red have been added to set of vertices whose shortest path from the starting vertex has been calculated.





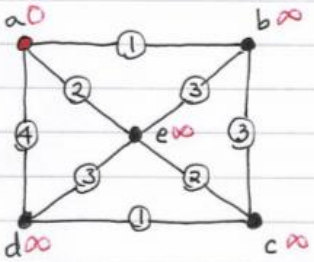


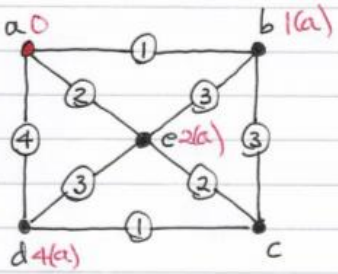


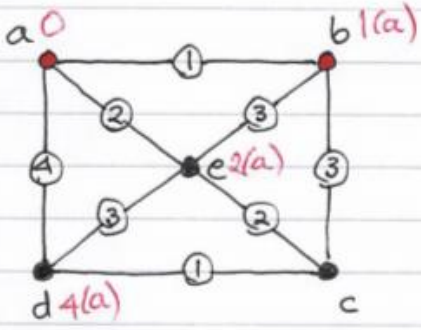


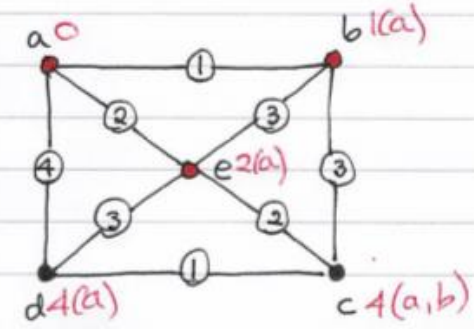
Shortest route = a, d, e, c.

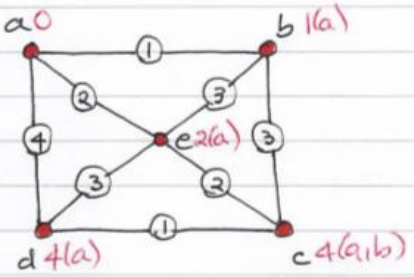
2.





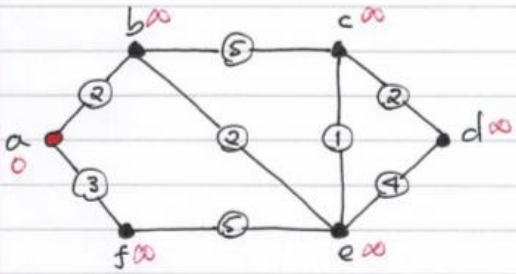


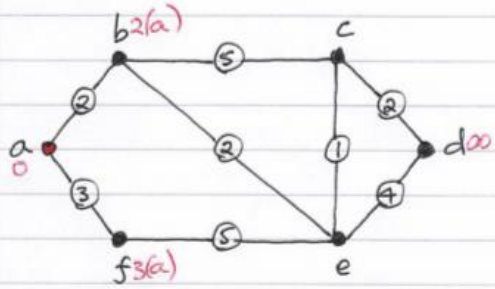


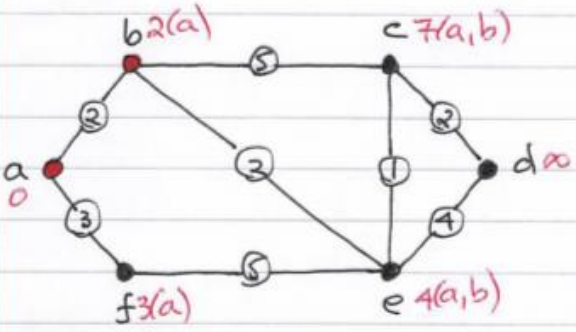


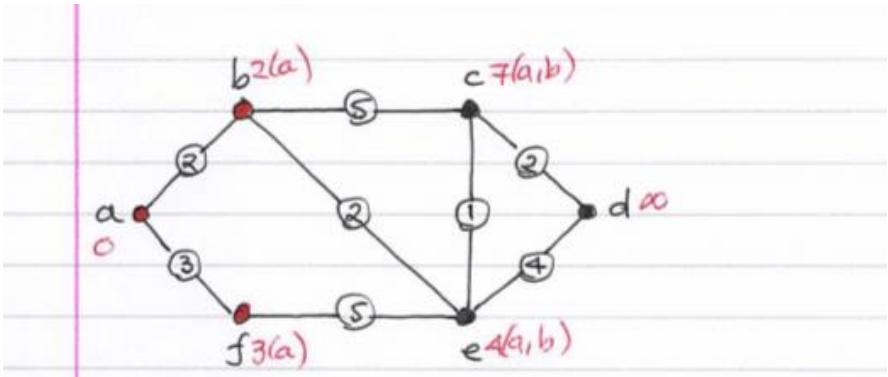
Shortest route = a, b, c
(also a, e, c)

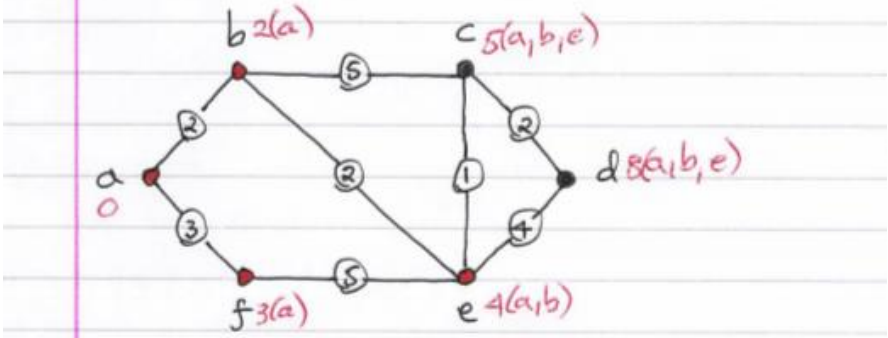
3.

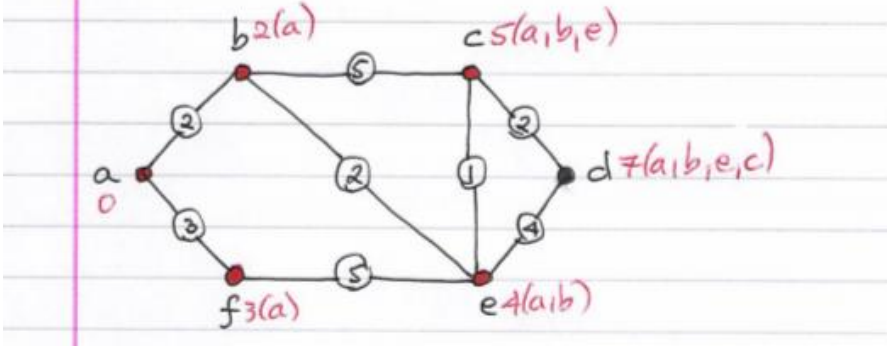


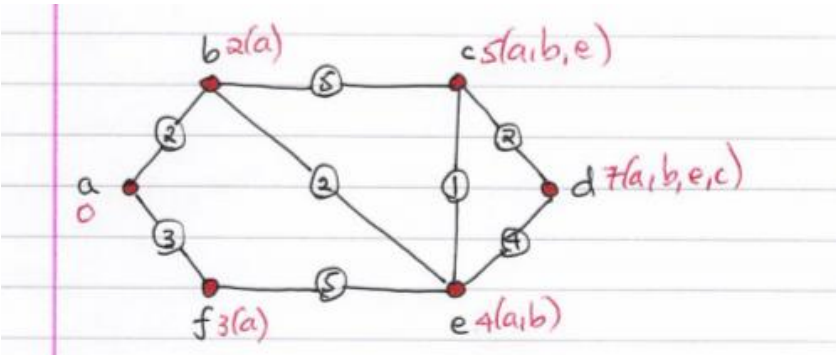






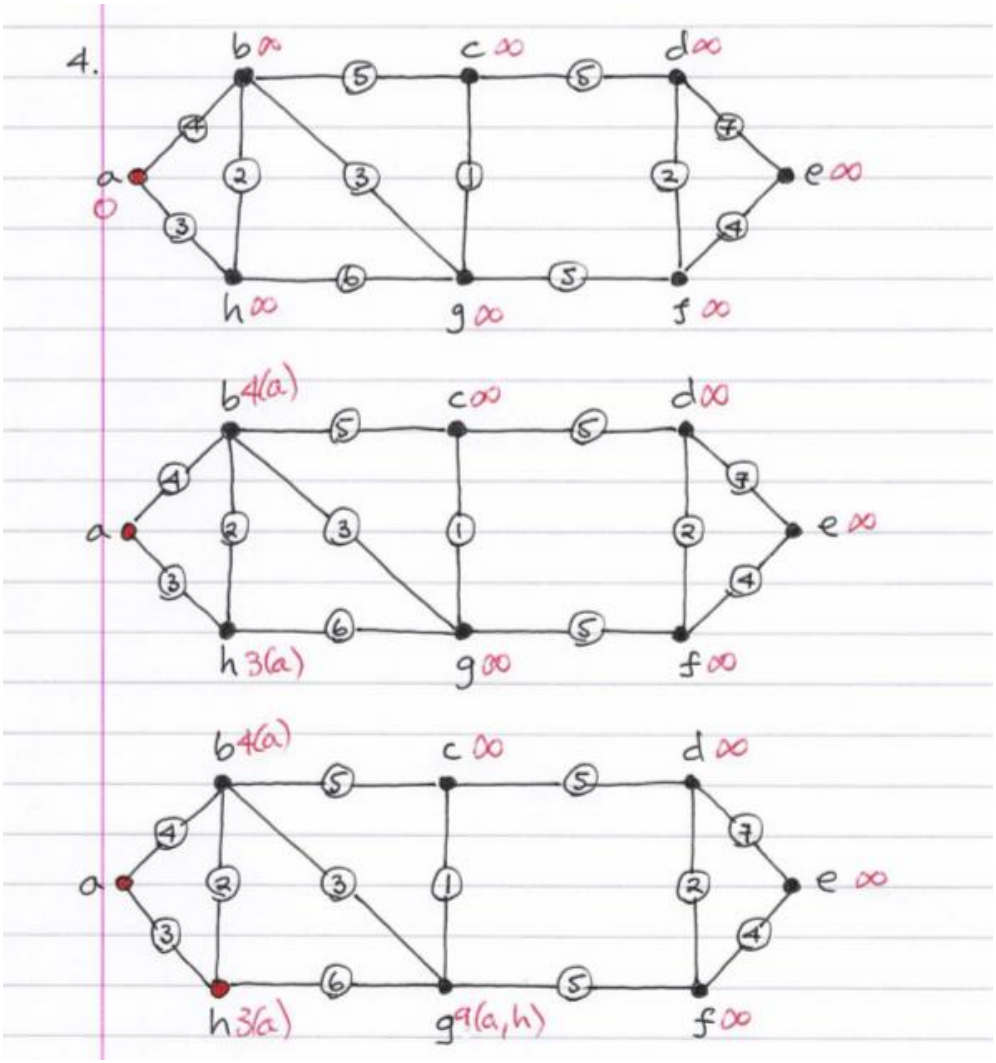


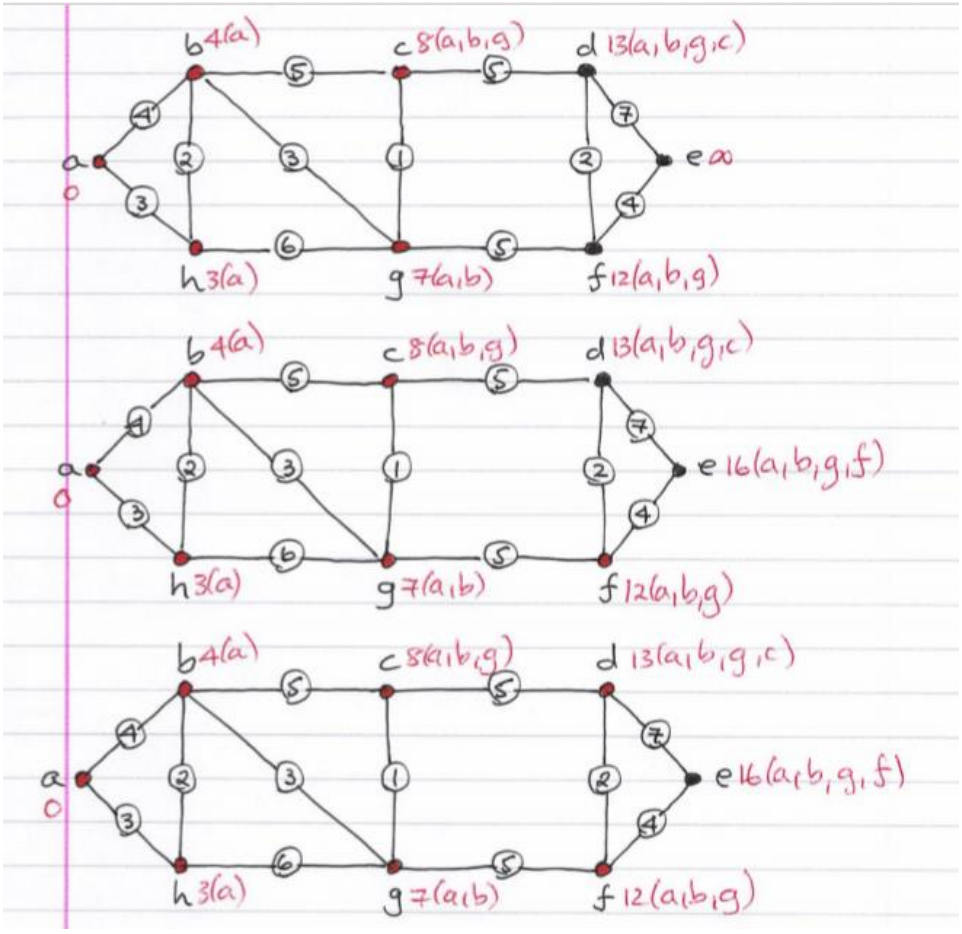


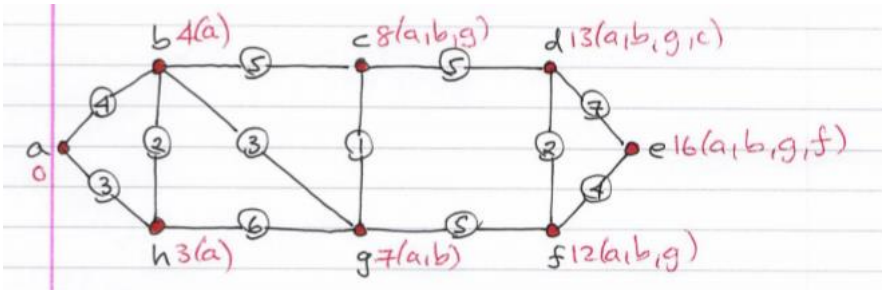


shortest route = a, b, e, c, d

4.


b ∞
c ∞
d ∞
a
0
e ∞
h ∞
g ∞
f ∞
b 4(a)
c ∞
d ∞
e ∞
h 3(a)
g ∞
f ∞
b 4(a)
c ∞
d ∞
e ∞
h 3(a)
g 9(a,h)
f ∞
b 4(a)
c 9(a,b)
d ∞
e ∞
h 3(a)
g 7(a,b)
f ∞
b 4(a)
c 8(a,b,g)
d ∞
e ∞
h 3(a)
g 7(a,b)
f 12(a,b,g)





Shortest route = a, b, g, f, e