Problem 3

(a) 90,8,7,56,123,235,9,1,653

a.1) selection sort

➔1,90,8,7,56,123,235,9,653

➔1,7,90,8,56,123,235,9,653

➔1,7,8,90,56,123,235,9,653

➔1,7,8,9,90,56,123,235,653

➔1,7,8,9,56,90,123,235,653

a.2) merge sort

(90,8,7,56,123) (235,9,1,653)

(90,8,7) (56,123) (235,9) (1,653)

(90,8) (7) (56) (123) (235) (9) (1) (653)

(90) (8) (7) (56) (123) (235) (9) (1) (653)

(8,90) (7) (56) (123) (235) (9) (1) (653)

(7,8,90) (56,123) (9,235) (1,653)

(7,8,56,90,123) (1,9,235,653)

(1,7,8,9,56,90,123,235,653)

(b) 3,1,4,1,5,9,2,6,5,3,5

Quick sort

I=0	**3** 1 4 1 5 9 2 6 5
I=1	3 **1** 4 1 5 9 2 6 5
Insert	1 3 4 1 5 9 2 6 5
I=2	1 3 **4** 1 5 9 2 6 5
I=3	1 3 4 **1** 5 9 2 6 5
Insert	1 1 3 4 5 9 2 6 5
I=4	1 1 3 4 **5** 9 2 6 5
I=5	1 1 3 4 5 **9** 2 6 5

I=6   1 1 3 4 5 9 **2** 6 5

Insert   **1 1 2** 3 4 5 9 6 5

I=7   1 1 2 3 4 5 9 **6** 5

Insert   **1 1 2** 3 4 5 6 9 5

I=8   1 1 2 3 4 5 6 9 **5**

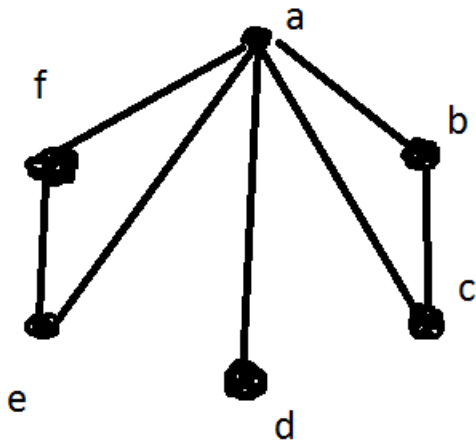   **1 1 2 3 4 5 5 6 9**

Problem 4

(a) this graph with these 5 vertices does not exist. You cannot have a vertex of degree 5. The highest degree you can have with 5 vertices is degree 4.

(b) 5+2+2+2+2+1=2e

➔e=7 edges

(c)

c.1) A➔B➔D➔C➔E➔G➔H➔F

c.2) A➔B➔C➔E➔H➔G➔F➔D

(d)   V1, (starts the index/no parent node)

          V0, (no parent node)

          V5,(because V1 is already in it)

          V2,(because it has V0 and V1 in it already)

          V3, (has V0 and V1)

V4,(has now V0 and V2 in it)

V6,(has V2,V4,V5 in it now)

V7,(has V6 in it)

So the sorting algorithm would be V1,V0,V5,V2,V3,V4,V6,V7.