1. \((71.3125)_n \rightarrow \text{(_______)}_2 \rightarrow \text{(_______)}_{\text{Excess}_127 \text{ floating point format}}\)

\((-57.38)_n \rightarrow \text{(_______)}_2 \rightarrow \text{(_______)}_{\text{Excess}_127 \text{ floating point format}}\) (12%)

2. What is the term of software engineering? (Give detail description about it.) (5%)
   Is it important for computer science and engineering? Justify your answer. (5%)

3. Explain the following terms of networks and give at least one protocol for each.
   (A) Connection vs. connectionless oriented protocols (4%)
   (B) Flow vs. congestion controls (4%)
   (C) Routing vs. routed protocols (5%)

4. Power function is used to compute the value of \(b^{a}\). Write a C/C++ code for the power function as concise as possible. (15%)

   ```c
   int power(int base, int exp)
   {
       int result = 1;
       for (int i = 0; i < exp; i++)
           result *= base;
       return result;
   }
   ```

5. Specify the functions of each layer in the ISO/OSI network model. (10%)

6. Draw a process state diagram, and discuss the state transition in a multiprogramming operating system. (10%)

7. (A) Why do we need a good algorithm? (3%)
   
   (B) How do we measure the goodness of an algorithm? (3%)
   
   (C) How do we know an algorithm is optimal for a problem? (4%)

8. Specify the key characteristics of the following data structures: (10%)
   
   (A) array  (B) linked-lists  (C) stack  (D) queue  (E) record

9. Specify the techniques used to implement virtual memory management. (10%)