

1. Please write down the full names of the following abbreviated computer science/engineering terminologies. Note that you are not required to explain them. (10%)  
(1) CPU, (2)ALU, (3)RAM, (4)MMU, (5)WWW,  
(6) IT, (7)AI, (8)BCD, (9)DBMS, (10)TCP
2. Please write down the full names of the following abbreviated computer science/engineering terminologies and make a brief explanation. (40%)  
(1) NAT (in computer network)  
(2) QoS (in computer network)  
(3) VoIP (in computer network and multimedia systems)  
(4) ADSL (in computer network)  
(5) SJF (in scheduling of operating systems)  
(6) FIFO (in scheduling of operating systems)  
(7) CMMI (in software engineering)  
(8) PKI (in computer security)  
(9) RFID (in wireless communication and smart cards)  
(10)SOC or SoC(in VLSI design, architecture, embedded systems)
3. Summarize the distinction between a BCD addition, and an integer addition. Note that please compare them at the assembly instruction level. (10%)
4. Suppose that A, B, C, R are binary signals. Suppose that we are to compute:  
 $R = A \text{ .and. } (B \text{ .or. } C)$ , where .and. is for logic "AND" .or. is for logic "OR".  
(i) Is it possible to implement R using only NAND gates? If your answer is yes, please draw a logic gate implementation for R. If your answer is no, please explain.  
(ii) Write a program to simulate R. (10%)
5. Write two programs, or algorithms, to compute factorial n, i.e. n!. One is to use a for-loop, the other is to use the recursive call. (10%)
6. Please explain the term 'an embedded system' and show an example. What are the differences between a general computer, such as a personal computer, and an embedded system? (10%)
7. Java programs are compiled into .class files, which consists of bytecodes. A Java Virtual Machine executes the bytecodes. (1) How does the Java Virtual Machine execute the bytecodes? (2) Why Java programs are platform independent? (10%)