國立成功大學 104 學年度碩士班招生考試試題

系所組別：工程科學系乙、丙、己組

考試科目：計算機概論

考試日期：0212，節次：2

※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

一、Explain the terminologies and give the function or characteristics. No point will be earned if Chinese translated only. (5% for each, total 30%)

(a) NAS;

(b) Pass by reference;

(c) Memory IO;

(d) RSS (Really Simple Syndication);

(e) NFC;

(f) DDoS.

二、Multiple choices (40%, right answer will earn 4%, wrong answer will earn -2%. No answer no earns.（答對得 4 分, 答錯倒扣 2 分， 扣至本題零分為止。不答不倒扣。））

(1) Which data structure is used to assist the execution of a subroutine call and return? (a) Queue; (b) Stack; (c) Tree; (d) Graph.

(2) Which logic gates can be used as an odd parity generator? (a) XOR; (b) OR; (c) XNOR; (d) NOR.

(3) An one dimensional array is used to implement a complete binary tree for storing the sequence A,B,C,D,E,F,G,H,I,J,..... Then who is the sibling node of E? (a) B; (b) F; (c) G; (d) D.

(4) Which of the following is not considered as a parameter by QoS? (a) bandwidth; (b) time delay; (c) reliability; (d) order of arrived packet.

(5) A DDR SDRAM chip can transfer data faster than that of SDRAM. What is the reason? (a) It uses pipeline technology; (b) It operates synchronously with system clock; (c) Twice times are transferred per clock cycle; (d) It is usually not needed to re-energize.

(6) Two computer systems called A and B with the same instruction set architecture and using the same assembler. The clock cycle time and average cycles per Instruction (CPI) of A are 0.25ns and 2.0, respectively. And that of B is 0.5ns and 1.2, respectively. To compare the performance of the two systems, which one is correct? (a) It cannot be compared; (b) A is better than B; (c) B is better than A; (d) Both of A and B are with the same performance.

(7) Which one is not the necessary condition for a deadlock? (a) No preemption; (b) Mutual exclusion; (c) Hold and wait; (d) Bounded waiting.

(8) What is the data unit used in the second layer of OSI? (a) Packet; (b) Segment; (c) Frame; (d) Message.

(9) Which one is not the software developing model? (a) Waterfall approach; (b) Iterative development; (c) Distributed approach; (d) Component based software engineering.

(10) A flip flop with two inputs A and B, and the inputs and its corresponding output (AB →output) are 00 → set, 01 → no change, 10 → complement, 11 → clear. If the output state of the flip flop will be changed from 0 to 1, then the inputs are (a) A=0, B=d (don't care); (b) A=d, B=0; (c) A=1, B=d; (d) A=d, B=1.

三、Assume *N* positive integers (each with 7 digits) are stored in a file called "DATAFILE". Write a program with **C** programming language, to read these data from the "DATAFILE", then to calculate the average value of these integers, and print out the average value on the screen. You can describe how the integers are stored in your "DATAFILE" firstly. Give proper comments to increase your program readability. (15%)

四、Merge sort is one of the sorting techniques. Assume there are *N* integers to be sorted by merge sort technique. Design a merge sort algorithm called MERGE_SORT to sort these *N* integers. (a) By recursive method (5%); (b) By iteration method. (10%)