國立聯合大學 101 學年度碩士班考試招生

___資訊管理研究所___ 入學考試試題

科 目： ___計算機概論___ 第_1_頁共_3_頁

A. 簡答題 30% (每題6分)

1. (a) What is the base B of number system if the equation $27_B + 35_B = 61_B$ is correct?

   (b) Use 2's complement number representation to calculate $27_{10} - 35_{10}$ by 8-bit words.

2. Please list the seven layers of OSI model and describe their tasks for each layer.

3. Explain the differnce between Hub, Switch, Router and Gateway.

4. (a) What's the network address and broadcasting address for a host with IP address 203.64.178.100 and MASK 255.255.255.240? How many IP addresses can be used for this network ?

   (b) Please subnetting the network 182.60.192.0/20 into 4 subnets equally and give the network addresses of these subnets.

   (c) Please subnetting the network 182.60.192.0/20 for a LAN with 1000 PCs and don't wast too much number of IP addresses. Please give the subnetted network address and MASK.

5. What's Data Independence ? What's Transaction ? What's its main purpose of Normalization?

B. 問答題 70% (1~2題, 每題10分)

1. (a) Linker and loader are important system programs. What are the functions of linker and loader?

   (b) Interpreter and compiler are two programming language types that can translate high-level language programs into low-level language codes. Please compare the advantages and disadvantages between them. What are the language types of C++, Java, Java Script?

   (c) A deadlock is a situation in an operating system. Please explain the situation of a deadlock and give an example to illustrate it. How can OS prevent deadlock?

2. (a) What are the two basic functions used in encryption algorithms? There are two basic techniques for encrypting information, symmetric encryption and asymmetric encryption. Please Compare the differences between them.

   (b) What is a digital signature? What properties a digital signature should have?

3. 針對下列問題寫出相對應之 SQL 語法(20 分)

   S 學生基本資料表 (sk#,sid,sname,saddress,stel,semail) primary key (sk#)

   T 教師基本資料表 (tk#,tname,taddress,ttel,temail) primary key (tk#)

   J 課程基本資料表 (jk#,jname,tk#) primary key (jk#) foreign key(tk#) reference T

   C 選課資料表(jk#,sk#,score) foreign key(jk#) reference J, foreign key(sk#) reference S
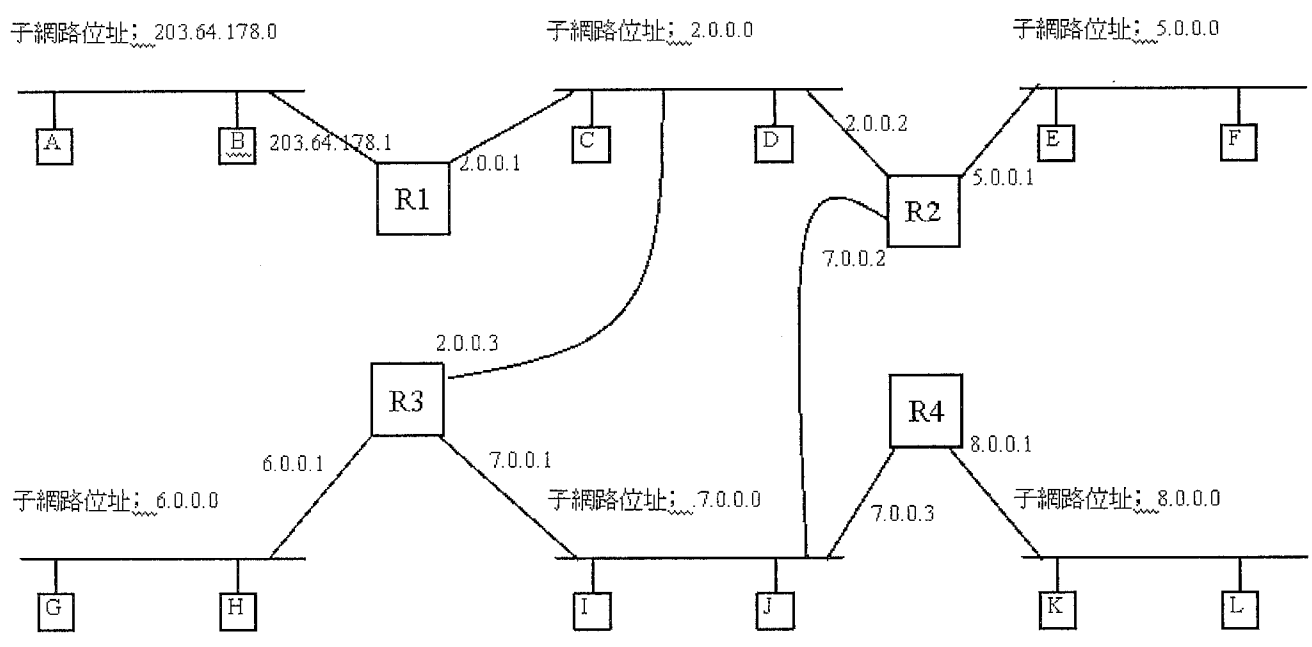
   (a)取出住在各縣市中華路(saddress)學生資料.

(b)取出選修課號(jk#)200 課程最高分,最低分學生成績(score)

(c)以子查詢取出所有選修教師(tname)teachera 課程之學生名單(sname),並按課程分組列示

(d)取得課程編號(jk#)及其對應修課人數

(e)調整 C 表格成績欄:80 以上加分 5%,60~79 加分 6%,其他加分 8%

4. Given a network topology and routing tables shown in Figure 1. (10 分)

Router R1		Router R2		Router R3		Router R4	
Destination	**Next**	**Destination**	**Next**	**Destination**	**Next**	**Destination**	**Next**
203.64.178.0	direct	2.0.0.0	direct	2.0.0.0	direct	7.0.0.0	direct
2.0.0.0	direct	7.0.0.0	direct	6.0.0.0	direct	8.0.0.0.	direct
7.0.0.0	2.0.0.3	5.0.0.0	direct	7.0.0.0	direct	5.0.0.0	7.0.0.2
8.0.0.0	2.0.0.2	8.0.0.0	7.0.0.3	203.64.178.0	2.0.0.1	203.64.178.0	7.0.0.2
5.0.0.0	2.0.0.3	6.0.0.0	2.0.0.1	5.0.0.0	7.0.0.3	2.0.0.0	7.0.0.1
6.0.0.0	2.0.0.3	203.64.178.0	2.0.0.1	8.0.0.0.	7.0.0.3	6.0.0.0	7.0.0.2

Figure 1

Please list the routing paths (packet delivering path) including routers and network addresses.
(i) From host A to host F
(ii) From host A to host L
(iii) From host L to host A
(iv) From host L to host G

5. 程式設計(請使用 C++或 Java) (20 分)

(a)請寫一個骰子類別(dice),並在其中設計一個建構子(constructor),做為初始化骰子各面應有的數字,同時提供一個方法(throw)可以模擬擲骰子的行為(即得到一個骰子的點數),另提供一個方法(show)可查看所擲出的點數,請注意在擲完骰子後可隨時查看骰子的點數。

(b)寫一函數 play 可以用(a)中的骰子類別產生兩個骰子,並提供同時擲兩個骰子後顯示點數總和的功能。