國立交通大學 94 學年度碩士班入學考試試題

科目名稱：網際網路概論（0402）　　考試日期：94 年 4 月 16 日 第 3 節

系所班別：資訊管理研究所　組別：乙組　

＊作答前，請先核對試題、答案卷（試卷）與准考證上之所組別與考試科目是否相符!!

1. (a) (5%) 何謂點陣圖形檔及向量圖形檔？並提出其差異？
(b) (5%) 何謂圖層？用處何在?

2. (8%) QoS 的基本運作原理大致可分為哪四大步驟?

3. (4%) HTTP 協定在 Client 端及 Server 端之間包含哪兩種主要訊息?

4. (4%) Which strategies can a company take to enhance network reliability through redundancy? (Choose two)
A. Eliminate single points of failure.
B. Flood frames for unknown destinations.
C. Send multiple frames to an end device.
D. Design alternate routes to a destination.
E. Forward MAC address tables to all switches on the network.
F. Eliminate multiple paths to the same destination.

5. (2%) How does noise impact a data signal in a communication system? (Choose one)
A. It replaces the data signal.
B. It blocks the data signal.
C. It is added to the data signal.
D. It creates a harmonic signal.

6. (2%) Why is half-duplex mode not permitted on 10 Gigabit Ethernet? (Choose one)
A. It was removed from the Ethernet standards as outdated technology.
B. Transmission is completed before the sending station can be made aware of any collisions.
C. Full-duplex transmission is needed in order to reach 10 Gigabit speeds.
D. Full-duplex stations transmit too quickly, blocking half-duplex stations from sending data.

7. (3%) Which devices separate collision domains? (Choose three.)
A. hubs
B. routers
C. bridges
D. switches
E. repeaters
F. transceivers

8. (11%) 試述設計 web engineering 時，其主要考慮內容有那些?

9. (11%) 試說明以 Internet-based EDI 其資訊安全如何確保? 其訊息如何接受?

10. (11%) 在 Internet 上做電子商務其網站軟體規劃方式有那幾種? 並說明其優缺點?

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11. In Internet database systems, an end-user may use a Web browser to query a database. A Web-to-database middleware is a program that interacts directly with the Web server and the database server to handle database requests.

(a) (7%) Draw a diagram to show the interactions between the browser, the Web server, the Web-to-database middleware, and the database server. Explain the interactions.

(b) (4%) Explain how the Web-to-database middleware interacts with the CGI and ODBC, respectively.

12. Let G represent a process of e-Services executed on the Internet. (i) G is organized by nodes and directed links. Each node represents an e-Service. Each directed link is a dependency. Dependencies are used to describe the execution order and relationship between e-Services within a process. (ii) A dependency d = <X, Y> connects two e-Services X and Y, in which X is the *preceding e-Service* and Y is the *succeeding e-Service*. The dependency d is an outgoing dependency of X and an incoming dependency of Y. An e-Service may have more than one incoming dependency (predecessor) or outgoing dependency (successor). (iii) The length of a path is the number of dependencies on the path. (iv) G has one starting e-Service S. (v) A shortest path from S to V is a path that contains the minimum number of dependencies for all paths from S to V. (vi) There is no cycle in G.

(a) (9%) Use adjacency matrix to represent G, the process of e-Services. Based on the adjacency matrix representation, write an algorithm to generate the shortest paths from S to all other e-services in G.

(b) (4%) Explain how your algorithm indeed finds the shortest paths.

13. Let E represent a set of e-services (e.g. PizzaOrder, ClothesSale, CarRental, MovieRental, etc.) and P denote a set of e-service providers (e-Com1, e-Com2, e-Com3, etc.) available on the Internet. Let $|E|=L$ denote the number of e-services and $|P|=M$ denote the number e-service providers. An e-Service provider *spi* is capable of providing a subset of e-Services, Ei, where $Ei \subseteq E$ and $|Ei| <= k$. Let G represent a process of e-Services to be executed on the Internet. G contains a set of e-services, which is a subset of E. G is organized by nodes (e-services) and directed links describing the execution order between e-Services. G has one starting e-Service S. An e-service provider may be assigned at hand to execute several e-services of different processes. The workload of an e-service provider *spi* is the number of e-services assigned to *spi* at hand. Let workload[*spi*] represent the current workload of the e-service provider *spi* at hand.

(10%) Use adjacency list to represent G, the process of e-Services. Write an algorithm to assign (select) the e-service providers to execute the e-services in G according to the heuristic of selecting the e-service provider with the minimum workload policy for each assignment of an e-service in G. The assignment starts from S.