



Course Title: System Design and analysis

Course Code: 6710

Final exam

Date: Sep.. 1. 2013

Allowed time: 3 hrs

Master in automatic control

Remarks: (Answer the following questions... assume any missing data)

**Question No 1 Points 20**

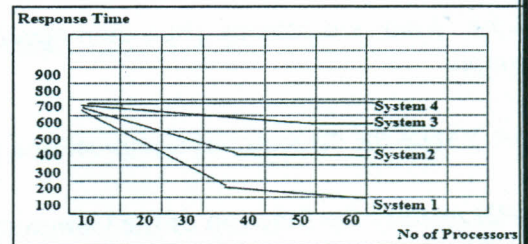
**Q1-A)** Find the relation between the following terms (B.W, Data bit rate, and Frequency)

**Q1-B)** List the different protocol within Transport Layer, then compare between their Functions (i.e similarities and difference)

**Q1-C)** Compare between the different types of data interchange methods within LAN , according to (speed, nature of the data, reliability, suitable technology, shared channel, and protocol)

**Q1-D)** For a given distributed system assume that you have 7 routers on the border of 10 LANs; 9 of these LANs are wired as Bus topology while the last one is wired as Star topology. State the whole topology of the system (Star – Bus – Hybrid – Mish). Explain your answer?

**Q1-E)** Next graph describe the behaviour of the four distributed systems among their response time and available no of processors. From the previous information state which of them is highest scalability and why?



**Question No 2 Points 20**

**Q2-A)** Declare the different ways that can be used to model the Distributed System, then compare between them?

**Q2-B)** List the different issues that characterize the Performance of communication channels within the distributed systems?

**Q2-C)** Compare between Caches and proxy servers? Propose some techniques that may be used to improve each

**Q2-D)** You happen to intercept a packet at a router in the Internet with two headers and as shown below. If you know that these two are the transport layer and the network layer headers, which do you think is the transport layer header and which the network layer header?



**Q2-E)** Suppose that you have a system with the following Ch/s (Request processing: 2 ms - I/O delay (no caching): 8 ms) compute

1. For a Single thread time required per requests, the number of processed requests per second.
2. For Two threads (no caching): time required per request, the number of processed requests per second
3. For two threads and caching: requests per second – Assume hit rate = 75%

**Question No 3 Points 20**

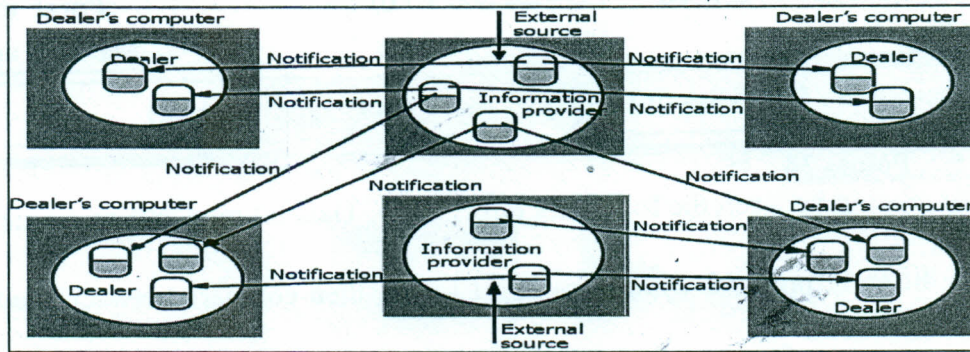
**Q3-A)** Write a short note about remote Desktop protocol, give some example?

**Q3-B)** For the Security Model (Fundamental Model) ; State the most important characteristics?

**Q3-C)** List the purpose of a firewall, then state the relation between it and Router?

**Q3-D)** Draw File attribute record structure

**Q3-E) For the following figure specify (no of events - no of notifications- No of objects )**



**Q3-E) State the File Service Architecture?**

**Q3-F) What packet switching connection allows bandwidth to be used on demand?**

**Question No 4 Points 20**

**Q4-A) Specify how to calculate Message transmission time within the distributed systems**

**Q4-B) What is meant by IPC, then specify the most important Characteristics, for each one give an example**

**Q4-C) State the structure of a request or a reply message**

**Q4-D) Specify the function of the Communication modules within the Distributed Objects Model**

**Q4-E) Write a short note about the relation between Processes and Threads**

**Question No 5 Points 20**

**Q5-A) Compare between Characteristics of File Systems and Distributed File System Requirements**

**Q5-B) When two routers use a routing protocol to exchange routing information, must they share a common network?**

**5-C) “wireless node is addressed by a protocol called Mobile IP” discuss the previous statement and depicts the problem that it will solv?**

**Q5-D) Discuss the different types of media access control within the Wireless LAN, for each give a breif discussion?**

**Q5-E) List the Wireless Network Categories, for each give a brief discussion and the type applications that will be suitable of such category?**