In the name of god

ENGLISH
for students of

Computer Science and ICT/IT

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Chapter One: *Comprehensions*

Read the following text and then answer the follow-up questions.

1.1 - Networking today

In today's business world, reliable and efficient access to information has become an important asset in the quest to achieve a competitive advantage. File cabinets and mountains of papers have given way to computers that store and manage information electronically.

Coworkers thousands of kilometers apart can share information instantaneously, just as hundreds of workers in a single location can simultaneously review research data maintained online.

Computer networking technologies are the glue that binds these elements together. The public internet allows businesses around the world to share information with each other and their customers. The global computer network known as the World Wide Web provides services that let consumers buy books, clothes, and even cars online, or auction those same items off when no longer wanted.

Networking allows one computer to send information to and receive information from another. We may not always be aware of the numerous times we access information on computer networks. Certainly, the internet is the most conspicuous example of computer networking, linking millions of computers around the world, but smaller networks play a role in information access on a daily basis.

Many public libraries have replaced their card catalogs with computer terminals that allow patrons to search for books far more quickly and easily. Airports have numerous screens displaying information regarding arriving and departing flights.

Many retail stores feature specialized computers that handle point-of-sale transactions. In each of these cases, networking allows many different devices in multiple locations to access a shared repository of data.

1. The term "coworkers" as it is used in the text is the same as

   i) Competitors.
   ii) Colleagues.
   iii) Companions.
   iv) Challengers.

2. The author is claiming that being competitive in today's world depends on

   i) Having information in cabinets that can be shared.
   ii) Having reliable and efficient means to access information.
   iii) Having information stored on computers that can be shared.
   iv) Having information stored in such a way that it can be shared simultaneously.

3. The term “off “ as it is used in the text means

   i) Off-line.
   ii) Get –rid of.
   iii) Get through.
   iv) Get out.

4. The text is claiming that networking technologies are the glue that binds

   i) Reliable and efficient access to information as well as information sharing.
   ii) The Internet business world together.
   iii) Store and management of information together.
   iv) Competition and reliability together.

5. The word “ conspicuous “ as used by the text is same as

   i) Complex.
   ii) Interesting.
   iii) Fabulous.
   iv) Remarkable.

6. From the text we understand that many retail stores have improved their efficiency by using

   i) World wide web.
   ii) A kind of IT.
   iii) On line computer networks.
   iv) On the spot sales.

7. The author is claiming that networking today allows

   i) Broad information access in every place.
   ii) Broad access of stored information.
   iii) Limited but secure access of information.
   iv) Limited but shared access of information.

8. The word “ repository “ as used in the text means

   i) Stored.
   ii) Shared.
   iii) Limited.
   iv) Broad.

1.2 - What is CSMA/CD

The acronym CSMA/CD signifies carrier-sense multiple access with collision detection and describes how a network protocol called Ethernet protocol regulates communication among nodes. While the term may seem intimidating, if we break it apart into its component concepts we will see that it describes rules very similar to those that people use in polite conversation. To help illustrate the operation of Ethernet, we will use an analogy of a dinner table conversation.

Let's represent our Ethernet segment as a dinner table, and let several people engaged in polite conversation at the table represent the nodes. The term multiple access covers what we already discussed above. When one Ethernet station transmits, all the stations on the medium hear the transmission, just as when one person at the table talks, everyone present is able to hear him or her.
Now let's imagine that you are at the table and you have something you would like to say. At the moment, however, I am talking. Since this is a polite conversation, rather than immediately speak up and interrupt, you would wait until I finished talking before making your statement. This is the same concept described in the Ethernet protocol as carrier sense. Before a station transmits, it "listens" to the medium to determine if another station is transmitting. If the medium is quiet, the station recognizes that this is an appropriate time to transmit.

Carrier-sense multiple accesses give us a good start in regulating our conversation, but there is one scenario we still need to address. Let's go back to our dinner table analogy and imagine that there is a momentary lull in conversation.

You and I both have something we would like to add, and we both "sense the carrier" based on the silence, so we begin speaking at approximately the same time. In Ethernet terminology, a collision occurs when we both spoke at once.

In our conversation, we can handle this situation gracefully. We both hear the other speak at the same time we are speaking, so we can stop to give the other person a chance to go on. Ethernet nodes also listen to the medium while they transmit to ensure that they are the only station transmitting at that time. If the stations hear their own transmission returning in a garbled form, as would happen if some other station had begun to transmit its own message at the same time, then they know that a collision occurred.

A single Ethernet segment is sometimes called a collision domain because no two stations on the segment can transmit at the same time without causing a collision. When stations detect a collision, they cease transmission, wait a random amount of time, and attempt to transmit when they again detect silence on the medium.

The random pause and retry is an important part of the protocol. If two stations collide when transmitting once, then both will need to transmit again. At the next appropriate chance to transmit, both stations involved with the previous collision will have data ready to transmit.

If they transmitted again at the first opportunity, they would most likely collide repeatedly indefinitely. Instead, the random delay makes it unlikely that any two stations will collide more than a few times in a row.

9. The author expresses that

   i) CSMA/CD describes a law.
   ii) CSMA/CD is a law that shapes computer networks.
   iii) CSMA/CD is a software that makes computers to work as networks.
   iv) CSMA/CD is a network procedure that allows computers in a network to talk to one another.

10. The word " intimidating " as used in the text means

   i) Complicated.
   ii) Influential.
   iii) Fearful.
   iv) Difficult to understand.

11. The author claims that
    i) CSMA/CD is like having a round dinner table.
    ii) CSMA/CD is a round dinner table.
    iii) CSMA/CD is like having a round dinner table with computers on it.
    iv) CSMA/CD can be simulated as people having polite conversation at a table to describe a network segment.
12. From the text we understand the carrier sense is the same as

    i) Listening to the medium to see if a computer is sending information before transmission.
    ii) Listening to the medium to see if a computer is sending information after transmission.
    iii) Transmitting information and determining if a station is listening to the network.
    iv) Transmitting information and determining if a station is also transmitting to the network.
13. From the text we understand that a collision occurs when

    i) Two computers in a network both speak at once.
    ii) Two computers in an Ethernet network both speak at once.
    iii) Two computers in an Ethernet network both receive signals at once.
    iv) Both i and ii.
15. The term " cease transmission " means

    i) Stop and wait.
    ii) Stop and wait sending information.
    iii) Stop and wait receiving information.
    iv) Stop transmitting information.

16. There is a factor in CSMA/CD which prevents two computers in an Ethernet network collide more than few times in a row that is

    i) Random stoppage of sending information.
    ii) Random delay due to each station's stoppage.
    iii) Random delay when information is colliding.
    iv) Both i and iii.

1.3 - Network communication

The early electronic communications devices-the telegraph and teletypewriter-communicated with one another by exchanging pulsed direct current (*dc*) signals over a long wire. Modern-day computers and terminals use an improved version of these techniques, as defined by RS-232C (that is *Recommended Standard 232 Version C*) and other computer communications standards.

Telephones, in contrast, communicate by passing an analog audio signal over the line. The strength and frequency of the signal varies depending on the volume and pitch of the sound being sent. Because the telephone network is designed to carry voice signals, it cannot carry the *dc* signals used in computer communications.
As the use of computers spread in the late 1950s and early 1960s, a need arose to connect computers and terminals via ordinary telephone lines and hence defined the basics of what is now known as ***ICT***. The answer to that need was the use of modem. A modem (that is, *a modulator /demodulator*) converts the on-and-off digital pulses of computer data into on-and-off analog tones that can be transmitted over a normal telephone circuit.

The early modems operated at the speed of 300 bits per second (or *bps*). This is painfully slow by modern-day standards, but it was fast enough for the slow-printing terminals of the day. Because it allowed the terminal to be physically separated from the host computer, the modem made computing resources available from virtually anywhere.

Recent improvements in modem technology allow speeds up to 57,600 bps, 192 times the speed of early modems. These modems use microprocessors to achieve these high communications speeds. Ironically, some newer modems contain more computing power than many early mainframe computer systems!

Regardless of the communications speed, all modems share some common characteristics. Since they must connect to a computer or terminal, virtually all modems contain an RS-232C communications interface. Similarly, most modems also contain an RJ-11 telephone-line interface.
The early modems used two pairs of tones to represent the on-and-off states of the RS232C data line. One pair of tones is used by the modem originating the call, and the other pair is used by the modem answering the call. The calling modem sends data by switching between 1,070 and 1,270 hertz, and the answering modem sends data by switching between 2,025 and 2,225 hertz. Newer modems use more and different tones to convey information, but the basic principle remains the same.

17. From the text it is understood that

    i) Early electronic communications was possible by sending information as pulsed signals with fixed current.
    ii) Early electronic communications was possible by sending information as dc binary signals.
    iii) Early electronic communications was possible by sending information as dc audio signals.
    iv) Both i and ii.

18. The author is claiming that
    i) Telephone and computer signals are the same.
    ii) Telephone and computer signals are the same but different in format.
    iii) Telephone and computer signals are different but both are dc signals.
    iv) Telephone and computer signals are different but both can be sent as analog audio signals.

19. From the text it is understood that
    i) Modem changes digital information into analog audio signals.
    ii) Modem changes digital and analog information signals into pulsed dc signals.
    iii) To send information over telephone lines modem must change information from digital signal to analog format.
    iv) To send information over telephone lines modem must change information from analog signal to digital format.

20. Without considering the speed
    i) All modems share the same entities.
    ii) All modems share the same interface lines.
    iii) All modems have in-common some processing power.
    iv) All modems share the same basic standard interface.

21. The term “ ironically “ as used in the text means

    i) Factually.
    ii) Clearly.
    iii) Basically.
    iv) Hence.

22. When a modem is in answering mode the text indicates, that modem
    i) Sends data by switching between 2,025 and 2,225 Hz.
    ii) Sends data by switching between 1.070 and 1,270 Hz.
    iii) Is a calling modem?
    iv) Is a called modem but sends data.

23. From the text it is understood that " RS-232C " is
    i) A communication technique.
    ii) A communication standard.
    iii) A computer communication standard.
    iv) A communication system.

1.8 - Data communications equipment

The earliest electronic communications devices-the telegraph and teletypewriter communicated by switching on and off voltage on a wire. The voltage used varied according to the equipment in use and the length of the wire involved. The circuit between two machines typically allowed communication in one direction at a time. Today's high –speed data communications equipment still operates on the principle of switching voltage on and off, but many improvements have been made to the basic communications circuit. In an attempt to ensure, that one serial device will talk to another, the Electronics Industries Association (EIA) created a standard to define the electrical signaling and cable connection characteristics of a serial port. In 1969, the EIA established Recommended Standard (RS) number 232 in version C, or RS232C, the most common type of communications circuit in use today.

The ASCII character set defines what numbers to use for each character, and the RS-232C standard defines a way to move the data over a communications link. Commonly used with ASCII characters, RS232C may also be used to transmit Baudette or EBCDIC data.

The RS-232C standard defines the function of the signals in the serial interfaces well as the physical connection used by the interface. This standard defines two classes of serial connections: one for the terminals, or DTE (Data Terminal Equipment), and one for communications equipment, or DCE (Data Communications Equipment).

A DTE device usually connects to a DCE device. For example, a personal computer (DTE) can connect to a modem (DCE). The serial port on most PCs is configured as a DTE port.

An RS-232C connection normally uses a 25-pin D-shell connector with a male plug on the DTE end and a female plug on the DCE end. Rules were made to be broken, and many manufacturers have taken liberties with the hardware they use to implement the RS-232C standard. When IBM PC/AT first appeared in 1984, IBM decided to use a 9-pin connector for the serial port. The AT's serial port shares an expansion card with a parallel printer port. There isn't enough room on the card bracket for two 25-pin plugs, so IBM abbreviated the serial connector to a 9-pin plug.

Other manufacturers followed suit, so you may encounter wither type of connector on your desktop computer, and you'll certainly find 9-pin connectors on laptop and notebook computers. Some manufacturers provide both 9-pin and 25-pin connectors for the same serial port.

48.From the text it can be understood that:
i) Data communication equipment works in serial.
ii) Data communication equipment works in parallel.
iii) Data communication equipment sends and receives data in serial format.
iv) Data communication equipment sends and receives data in parallel format.

49.Communication devices in early days were

i) Allowing communication in one direction only.
ii) Allowing communication in one direction between two computers only.
iii) Allowing communication in one direction between any two computers.
iv) Allowing communication in one direction between any two computers at a time.

50.From the text it is understood that

i) The ASCII codes define a number for a character while RS232-C moves that number over a communication link.
ii) The ASCII codes assign a number to each character while RS232-C defines how data is to be moved over network links.
iii) Both i and ii.
iv) None.

51.The difference between DTE and DCE is that

i) DTE and DCE are both on the same side.
ii) DTE is the host while DCE is the client.
iii) DCE connects to DTE.
iv) DTE connects to DCE.

52.The term " abbreviate " as used by the text means

i) Summary.
ii) Abstract.
iii) Magnified.
iv) Miniaturized.

53.The term " rules were made to be broken " means

i) Everybody is free to break the law.
ii) Everybody can do whatever he or she like.
iii) Everybody can implement the law according to his or her taste.
iv) There is flexibility when implementing a law.

1.9 – Routers and layer 3 switching

While most switches operate at the data layer (layer 2) of the OSI Reference Model, some incorporate features of a router and operate at the Network layer (layer 3) as well. In fact, a layer 3 switches is incredibly similar to a router. When a router receives a packet, it looks at the layer 3 source and destination addresses to determine the path the packet should take. A standard switch relies on Media Access Control (MAC) addresses to determine the source and destination of a packet, which is layer 2 (Data) networking.

The fundamental difference between a router and a layer 3 switch is that layer 3 switches have optimized hardware to pass data as fast as layer 2 switches, yet they make decisions on how to transmit traffic at layer 3, just like a router. Within the Local Area Network (LAN) environment, a layer 3 switch is usually faster than a router because it is built on switching hardware. In fact many of well-known layer 3 switches are actually routers that operate faster because they are built on 'switching' hardware with customized chips inside the box.

The pattern matching and caching on layer 3 switches is similar to the pattern matching and caching on a router. Both use a routing protocol and routing table to determine the best path. However, a layer 3 information switch has the ability to reprogram the hardware dynamically with the current layer 3 routing information. This is what allows for faster packet processing. On current layer 3 switches, the information received from the routing protocols is used to update the hardware caching tables.

54.From the text it is understood that

i) Layer 3 is a router.
ii) Layer 3 functions are the same way as router functions.
iii) Router uses layer 3 to control its functions.
iv) Layer 3 uses router to control its functions.

55.MAC address is used by a switch to
i) Obtain layer 2 networking characteristics.
ii) Obtain layer 3 networking characteristics.
iii) Make source and destination address of layer 2 characteristics.
iv) Make source and destination address of layer 3 characteristics.

56.The text claims that

i) Switches normally operate at the layer 2.
ii) Switches normally operate at the layer 2, but use some of layer 3 characteristics as well.
iii) Switches normally operate at router level.
iv) Switches pass data as fast as routers.

57.From the text it is understood that

i) Switch speed at layer 2 is similar to layer 3 switch.
ii) Switch speed at layer 2 is faster than layer 3.
iii) Switch speed at layer 3 is faster than layer 2.
iv) Both i and ii.

58.The hardware caching tables are updated by

i) Router.
ii) Layer 3 router.
iii) Layer 2 switch.
iv) Layer 3 switch.

59.The term "pattern matching " as used by the text means

i) Bytes are checked with respect to their format similarity.
ii) Bits are checked with respect to their format similarity.
iii) Addresses are checked with respect to their format similarity.
iv) Both ii and iii.

1.10- What is VLAN

As networks have grown in size and complexity, many companies have turned to virtual local area networks(VLANs) to provide some way of structuring this growth logically. Basically, a VLAN is a collection of nodes that are grouped together in a single broadcast domain that is based on something other than physical location.
A broadcast domain is a network (or portion of a network) that will receive a broadcast packet from any node located within that network. In a typical network, everything on the same side of the router is all part of the same broadcast domain. A switch that you have implemented VLANs on has multiple broadcast domains, similar to a router. However, you still need a router (or layer 3 routing engine) to route from one VLAN to another – the switch can't do this by itself.
You can create a VLAN using most switches simply by logging into the switch via Telnet and entering the parameters for the VLAN (name, domain and port assignments). After you have created the VLAN, any network segments connected to the assigned ports will become part of that VLAN.
While you can have more than one VLAN on a switch, they cannot communicate directly with one another on that switch. If they could, it would defeat the purpose of having a VLAN, which is to isolate a part of the network. Communication between VLANs requires the use of a router.
VLANs can span multiple switches, and you can have more than one VLAN on each switch. For multiple VLANs on multiple switches to be able to communicate via a single link between the switches, you must use a process called trunking – trunking is the technology that allows information from multiple VLANs to be carried over a single link between switches. The VLAN trunking protocol (VTP) is the protocol that switches use to communicate among themselves about VLAN configuration.
60.From the text it is understood that VLANS are the result of
i) Network growth and complexity.
ii) Structuring the networks.
iii) Networks poor performance.
iv) Security of networks.
61.VLANS is a collection of logical nodes that have
i) Physical location.
ii) Physical address.
iii) Shared common medium.
iv) Both i and iii.
62.That part of a network which receives a packet, addressed to all nodes in a network is called
i) Router.
ii) Domain.
iii) Point- to- point domain.
iv) Broadcast domain.

63.From the text it is understood that

i) Router and switch both have multiple broadcast domains.
ii) Router and switch are similar as far as broadcast domains are concerned but are different in routing procedures.
iii) Router is faster than switch.
iv) None.

64.The text expresses that information from multiple VLANS is sent between switches via
i) A single link called trunking.
ii) A link called trunk.
iii) A technology called trunk.
iv) None.

65.In case of multiple VLAN, communication between them is
i) Not possible via a single switch.
ii) Possible via a single switch.
iii) Possible through a router.
iv) None.

1.11- What is firewall

A firewall is simply a program or hardware device that filters the information coming through the Internet connection into your private network or computer system. If an incoming packet of information is flagged by the filters, it is not allowed through.
Let's say that you work at a company with 500 employees. The company will therefore have hundreds of computers that all have network cards connecting them together. In addition, the company will have one or more connections to the Internet through something like T1 or T3 lines.
Without a firewall in place, all of these hundreds of computers are directly accessible to anyone on the Internet. A person who knows what he or she is doing can probe those computers, try to make File Transfer Protocol (FTP) connections to them, try to make Telnet connections to them and so on. If one employee makes a mistake and leaves a security hole, hackers can get to the machine and exploit the hole. With a firewall in place, the landscape is much different.
A company will place a firewall at every connection to the Internet (for example, at every T1 line coming into the company). The firewall can implement security rules. For example, one of the security rules inside the company must be :
Out of the 500 computers inside this company, only one of them is permitted to receive public FTP traffic. Allow FTP connections only to that one computer and prevent them on all others.
A company can set up rules like this for FTP servers, Web servers, Telnet servers and so on. In addition, the company can control how employees connect to Web sites, whether files are allowed to leave the company over the network and so on. A firewall gives a company tremendous control over how people use the network.

66.The author is claiming that

i) A firewall is a program that filters information going to the Internet.
ii) A firewall is a hardware and software that filters information going to the Internet.
iii) A firewall is a hardware and software that filters information coming from the Internet.
iv) Both i and iii.

67.From the text it is understood that

i) Networks are connected to the Internet via telephone lines.
ii) Networks are connected to the Internet via T1 or T3 lines.
iii) Networks are connected to the Internet via firewalls.
iv) All i,ii, and iii.

68.The term “ security hole “ means

i) Leaving a network insecure.
ii) Leaving a program insecure.
iii) Making a domain space in the network.
iv) Both i and ii.

69.The term “ the landscape is much different “ means

i) The image of a network is different.
ii) Using firewalls changes the network structure.
iii) Using firewalls makes a noticeable change to network access.
iv) Both i and iii.

70.Using firewalls

i) Network users can be controlled by one another.
ii) Network users can control network access.
iii) Network access can be controlled.
iv) None.

1.12- The Birth of Voice Transfer

The birth of voice transfer took reality with the arrival of what is today called telephone. The telephone arrived as a practical instrument over a century ago in 1876, an outgrowth of experiments on a device to send multiple telegraph signals over a single wire.

Alexander Graham Bell, a native of Scotland, while conducting electrical experiments spilled acid on his trousers. His sulphurous reaction, the now famous “ Mr. Watson, come here, I want you”, brought Thomas A. Watson on the run not only because of his employer’s distress, but because the words had been carried by electricity into Watson’s room and reproduced clearly on his receiving set.

The simple instrument being tested on Court Street in Boston on March 10, 1876 wasn’t very practical (the acid was used in the system), but improvement followed so rapidly that putting into action’s Bell’s concept of a public telephone network- “this grand system”, “whereby a man in one part of the world may communicate by word of mouth with another in a distant place”- was well underway by January of 1878, when the first commercial exchange was operated in New Haven. By 1907, one hotel alone (the Waldrof Astoria in New York City) had 1,120 telephones and processed 500,000 calls per year.

That concept has grown into an industry in which one entity (American Telephone and Telegraph Company) is the largest company on earth, providing over 100 million telephone sets, making a profit of several billion dollars per year, and employing over one million people.

71.The author is claiming that
i) Arrival of telephone was the result of experiments on acid.
ii) Arrival of telephone was the result of experiments on telegraph lines.
iii) Arrival of telephone was the result of experiments on a device made by Bell.
iv) Both ii and iii.

72.The author expresses that what revolutionized the world was a
i) Famous quote by Bell to Watson.
ii) Famous quote by Watson to Bell.
iii) Famous sulphurous reaction by Bell.
iv) Famous sulphurous reaction by Watson.

73.The author claims that Bell and Watson were doing their experiments on
i) Walrof Astiria hotel.
ii) Court street Boston.
iii) New York City.
iv) Both i and ii.

74.From the text it can be said that
i) Bell called his achievement “ this great system “.
ii) Watson called his achievement “ this great system “.
iii) Bell called Bell’s achievement “ this great system “.
iv) None.

75.The term “ sulphurous reaction “ means:
i) Bell was angry and shouting.
ii) Bell was frightened therefore shouting.
iii) Bell was happy.
iv) Bell was happy and shouting.

76.What followed after Bell’s achievement
i) Resulted in networks employing many people in the world.
ii) Resulted into an industry employing hundreds of millions of people throughout the world.
iii) Resulted in computer networks.
iv) Resulted in the Internet.

1.21- The Fundamentals of Cache

I can recall one of my friend’s 486 DX 33s which had a very large (for the time) 256k of L2 cache. This meant, of course, that it was off-die on the motherboard, since no slot 486’s was around. This is due in part to the fact that it had farther to travel to get to the processor. Because the speed of electricity is not instantaneous, the latency involved with caches is also tied to how far it has to travel. In this case, even if the latency of a cache were zero (not possible – you cannot send anything instantaneously), latency would be incurred because of the fact that it takes time to transmit the data to the processor.
Another thing must be explained about latency of a cache. For example, while the latency of the L1 cache is precisely the number given, the L2 cache isn’t just the number of clocks that it takes for the L2 to give the desired information to the core. It is the latency of the L2 cache, plus the latency of the L1.

This happens because in most cases, the processor has to wait for a L1 miss occur before searching the L2 for the information. Therefore, the latency of the L2 is the latency of the L1 cache, plus the timing required for a L2 hit. This works its way down the memory hierarchy.
Socket 5 and 7 motherboards continued to use external L2 caches. Slot 1 evolved and continued the use of external caches. Slot 1, Slot 2, and Slot A also allow a " backside bus ", which in this case run at certain fractions of the core clock speed, and they transmit data more frequently than when the L2 cache was on the motherboard, which was a great boon for performance.
Socket 8, was an oddball with on-package, but off-die, cache, which is better than merely being on the same daughter card as the CPU, but not as good as being truly integrated onto the same die. It was, in fact, cost prohibitive, hence one of the reasons for the slot architecture.
Those who are halfway observant of the CPU industry have surely notice the shift from socket to slot, and from slot back to socket with the advent of the Socket 370 Celeron, and subsequently the socketed Pentium Ivs. AMD is doing likewise with their Thunderbird Athlons and their Durons. There's a good reason for this about-face; it's now technically possible and economically desirable to build these processors with the cache on the CPU die due to the smaller fabrication processes. When the processes were larger, caches took up more space, thus power and generated more heats as well, which are detriments to clock speed.
Because process technologies have gotten to the point where it can be commonplace to have an L2 cache on the same die as the processor, many designers have started to do this in practice. The benefit from this is threefold; manufacturers no longer need to purchase expensive SRAM's for their L2 cache, which lowers costs even while taking the larger dies into consideration,
Since being able to remove the cartridge and get rid of the external SRAM's saves quite a bit, because the L2 cache is now on-die, there is far less distance for the information to travel from the cache to the registers, and thus, much lower latencies; and, if the architects feel it worthwhile to dig back into the core and make a wider bus interface, they can massively increase bandwidth.
Recall that bandwidth = bus-width * transfer/second, and I say transfer/second because when something states 300 MHz. DDR, it is sometimes difficult to determine if it is 150 MHz. That has been " double pumped " for 300 mega-transfer per second, or if it is a 300MHz., but at double data rate, meaning 600 mega transfer per second.

127.The text suggests that the L2 cache on 486 was built
i) Inside the 486.
ii) Outside the 486 but on the main board.
iii) Outside the 486 but inside its socket.
iv) 486 was on a main board, which had, L2 built on it.

128.The text says that latency is dependent on
i) Speed.
ii) Electricity.
iii) Distance.
iv) Instantaneous.

129.The author is claiming that latency for L2 is
i) Delay in L1 plus delay in hitting L2.
ii) Delay in L1 together with delay in L2 hit.
iii) Hitting L1 while adding delay of L2.
iv) None.
130.The term “ halfway observant “ means
i) Half way looking at.
ii) Full way looking at.
iii) Study of a particular subject with full concentrations.
iv) Study of a particular subject with interest.
131.The term “ cut throat “ means
i) Killing L2.
ii) Not economically useful.
iii) Not economical to use in common PC.
iv) Very chip but not feasible.
132.The text is claiming that 300 MHz. DDR means
i) 150 MHz. On each side of DDR.
ii) 300 MHz. On both side of DDR.
iii) 150 MHz. On both side of DDR.
iv) 300 MHz. On each side of DDR.

1.27- The Mobile Agents

A mobile agent is a program that can migrate under its own control from machine to machine in heterogeneous network. In other words, an agent can suspend its execution at any point; transport its code and state to another machine, then resume execution on the new machine. By migrating to the location of an electronic resource, an agent can access the resource locally and eliminate the network transfer of all intermediate data. Thus, the agent can access the resource efficiently even if network conditions are poor or the resource has a low-level interface.
Mobile agents move you away from the rigid client/server model towards a model in which programs communicate as peers and act as wither clients or servers depending on their current needs. Existing applications for mobile agents include electronic commerce, active documents and mail, information retrieval, and workflow. Potential applications include most distributed applications; particularly those that must run on disconnected platforms or that must invoke multiple operations at each remote site.
Agent Tcl is a mobile-agent system under development at Dartmouth College, which has four levels. The lowest level is an API for the available transport mechanisms. The second level is a server that runs at each network site. The tasks performed by the server include:

- Keeping track of the agents running on its machine and answering queries about their status.
- Accepting incoming agents, authenticating the identity of their owners, and passing the authenticated agent to the appropriate interpreter. The server selects the best transport mechanism for each outgoing agent.
- Providing a flat namespace for agents and allowing agents to send messages to each other within this namespace. Each name includes the network location of the agent. The server buffers incoming messages and selects the best transport mechanism for outgoing messages.

- Providing access to a nonvolatile store so that agents can back up their internal states as desired. The server restores the agents from the nonvolatile store in the event of machine failure.

All other services – navigation, network sensing, group communication, fault tolerance, location-independent addressing, and access control-are provided by agents. The most important service Agent Tcl prototype is resource manager agents, which guard access to critical system resources such as the screen, network, and disk. The third level of the Agent Tcl architecture consists of an interpreter for each available language. Finally, the top level of the Agent Tcl architecture consists of the agents themselves. (1379 Tehran University Exam).

153.Which of the following statements is a correct description for agents?
i) Agents run on one machine but can answer queries about their status.
ii) Agents provide a framework for incorporating languages.
iii) Agents are a kind of interpreter.
iv) None of the above.

154.At which level of the Tcl architecture, the state of executing agents is restored?
i) Fourth level.
ii) First level.
iii) Third level.
iv) Second level.

155.Which of the following communication models are used by mobile agents?
i) Strict client/server model.
ii) Connection-less model.
iii) Peer-to-peer model.
iv) Distributed model.

156.Authentication of agents is done by
i) Agents themselves.
ii) The security model.
iii) The state module
iv) The server at each network site.

1.28- The Power PC Family

The most advanced processors in the Pentium and P6 Intel family achieve high performance through multiple function units, pipelining, on chip instruction and data caches, and the capability for issuing multiple instructions per cycle. The Power PC has all of these performance enhancing features. The next paragraphs detail the extent to which different Power PC processors use these features. Thus, both RISC and CISC design approaches share many performance-enhancing features.
If we consider only instruction sets and addressing modes, the Power PC architecture has somewhat more complex features than those found in most RISC designs. Consider the following:
The Power PC has a Multiply-add instruction that performs the operation on floating-point operands. In the index addressing mode, the index register can be updated to the computed effective address value as a side effect, leaving the displacement value

unchanged. Load/Store Multiple instructions cause a contiguous block of operands to be transferred between the memory and the processor registers.
A class of conditional branch instructions decrement a counter and then branch, based on whether or not the decremented value has reached 0. Such instructions and addressing mode features exceed the usual RISC style. These four features are useful in performing multiple arithmetic operations required in signal processing tasks, processing lists of operands, saving and restoring processor registers on procedure entry and exit, and efficiently terminating loops, respectively. Using these features yields shorter programs. Power PC designers have incorporated these features without unduly compromising the efficient, streamlined flow of simple, pipelined instructions that is a basic property of RISC machines.
The Power PC architecture is a successor to the POWER architecture used in the processor of the IBM RISC system (RS) 6000 line of computers. The first implementation of the Power PC architecture is the 601 processor, introduced in 1993. The 601 is a transition processor between the two architectures; as such, it implements a superset of POWER and Power PC instructions. This allows the 601 to run compiled POWER machine programs as well as Power PC programs. The second processor in the family, the 603, is the first purely Power PC processor.
The Power PC 601 processor chip, containing 2.8 million transistors, was first used in IBM desktop machines in late 1993. The 601 is a 32 bit processor, intended for desktop, portable, and low-end multiprocessor systems. Different versions are available with processor clock rates of 50,66, 80, and 100 MHz.
The Power PC 601 has a 32 Kbytes cache on the processor chip for holding both instructions and data. The cache is organized in eight-way associative sets. Three independent execution units are provided: an integer unit, a floating point unit, and a branch processing unit. Up to three instructions can be issued for execution in a clock cycle, for super scalar operation. The 601 has four pipeline stages for integer instructions and six for floating point instructions.
The 603 processor also has a 32 bit processing width. Intended for desktop and portable machines, it is a low-cost, low-power processor, consuming about 3 watts of electrical power at 80 MHz. The five execution units provided could operate in parallel, so the instruction issuing and control hardware, which can issue up to three instructions per clock cycle, is somewhat more complex than in the 601. The on chip cache is divided into two Kbytes sections for separate, temporary storage of instructions and data. (1379 Tehran University Exam).
157.Regarding the ways to achieve high performance, the text mentions that

i) Only the processors in the Intel family use techniques to achieve high performance.
ii) The Power PC has more enhanced features compared to the Pentium and the P6.
iii) The Pentium and the P6 have more enhanced features compared to the Power PC.
iv) The Power PC and the advanced processors in the Intel family utilize similar techniques.

158.Suppose that we intend to multiply two operands and add the result to the value of a third operand. With equal clock rates

i) The Pentium and the P6 are the best for this purpose, because they are capable of issuing multiple instructions per cycle.
ii) The Power PC calculates the result faster than the Pentium and the P6, at speed equal to that of other RISC processors.
iii) The Power PC calculates the result faster than other RISC processors.
iv) The text does not give any specific remarks in this regard.

159.Which of the following features of Power PC is useful in terminating loops efficiently?
i) Having the multiply-add instructions.
ii) Having a class of confident ional branch instructions, which decrement a counter and then branch, based on whether or not the decremented value has reached 0.
iii) The special index addressing mode and the load/store multiple instructions.
iv) All the above four features.

160.Comparing the Power PC 601 and the Power PC 603 processors, we can observe a major difference in terms of
i) The number of independent execution units.
ii) The width of processor registers and busses.
iii) The number of instructions that can be issued for execution in a clock cycle.
iv) All of the above.
161.According to the comprehension text the Power PC family of processors are
i) 32 bit processors.
ii) 16 bit processors.
iii) 64 bit processors.
iv) Composed by two 32 bit processors.

162.Which of the following statements is wrong?
i) The 601 processor has six pipelined stages for floating point instructions.
ii) The 603 processor is a low cost processor.
iii) The Power PC family of processors has multiple function units.
iv) The Power PC architecture has a purely RISC architecture.

163.Which of the following processors can issue up to three instructions per clock cycle?
i) 601 processor.
ii) 603 processor.
iii) 601 and 603 processors.
iv) None of the processors in the Power PC family.

1.29- The Ultrasonic Technology

Ultrasonic is the term used to describe the study of sound like waves whose frequency is above the range of normal human hearing. Audible sound frequencies extend from about 30 to 20,000 hertz (1Hz = 1 cycle per second). The actual waves and the vibrations producing them are called ultrasound. As late as 1900 ultrasound was still a novelty and studied only with a few specially made whistles, by 1930 it had become an interesting but small area of physics research. In the 1960s and 70s, however, it became an important research tool in physics, a far-ranging instrument for flaw detection in engineering, a rival to the X ray in medicine, and a reliable method of underwater sound signaling. The range of frequencies available has been extended to millions and even billions of hertz.

Ultrasonic waves travel through matter with virtually the same speed as sound waves-hundreds of meters per second in air, thousands of meters per second in solids, and 1,500 meters per second (5,000 ft/sec) in water. Most of the properties of sound waves (reflection, refraction, and so forth) are also characteristic of ultrasound. The attenuation of sound waves increases with the frequency, however, so that ultrasonic waves are damped far more rapidly than those of ordinary sound. For example, an ultrasonic wave of 1MHz frequency passing through water will lose half of its intensity over a distance of 20 m (66 ft) through absorption of the energy by the water, in air, the distance over which the intensity falls by half would be a few centimeters. At the audio frequency of 20,000 Hz, the corresponding distances for water and for air would be about 50 km (30 mi) and 5 m (16.6 ft).

The intense small-scale vibrations of ultrasound are also used industrially to shake dirt or other deposits off metals. The ultrasonic transducer, by removing oxides from metal surfaces, aids in the processes of soldering and welding. Plastic powders can be molded into small cylinders by similar techniques. Ultrasound is further use in atomization of liquids and even metals and in the precipitation of smoke particles before they enter the environment.

Ultrasonic transducers also serve in medicine in numerous ways. The vibrations of a transducer can be conveyed to a cutting edge in ultrasonic drills and saws, for use in surgery and dentistry, for example, pulses of ultrasound can be sent into the body without the need for surgery, as well, to shutter kidney stones and gallstones. More generally, ultrasonic transducers have come to be widely used in medical imaging for diagnosis of disease states and the evaluation of internal organs and structures. Because different portions of the body reflect and scatter sound waves at different rates, the returning echo can be formed into a picture of these structures. A handheld transducer is moved across the part of the body to be scanned, coupled to the skin with gel or liquid to prevent air from interfering with the transmission of sound waves. The painless procedure takes anywhere from a few minutes to an hour. (1379 Exam).

164.Ultrasonic refers to sound like waves that

i) Is audible.

ii) We can hear.

iii) Vibration waves.

iv) Are above 20,000 Hertz.

165.Starting at about 35 years ago, ultrasonic was used for the first time for
i) Detecting flaws.
ii) Far reaching flaws.
iii) Researching physics tools.
iv) Making whistles.

166.Other uses of ultrasonic include
i) Use alongside with X-ray.
ii) Frequency range detection.
iii) Underwater sound signaling.
iv) An X-ray rival.

167.Sound waves and ultrasonic waves
i) Do not have the same refraction property.
ii) Deflect very differently from each other.
iii) Are different in the way they lose energy.
iv) Attenuate the same way.

168.An industrial use of ultrasonic waves is
i) Shaking dirt off deposits.
ii) Cleaning surfaces for soldering.
iii) Smoking particle generation.
iv) Liquidifying metals.

169.Based on the text, what makes an ultrasonic device a useful tool in surgery
i) Its transducing property.
ii) The fact that it causes vibrations.
iii) Conveying electricity.
iv) Ease of use by doctors.

170.What makes ultrasonic useful in obtaining a picture of an internal body organ
i) Because sound waves scatter easily.
ii) It propagates through internal tissues.
iii) Because sound waves are reflected differently by different organs.
iv) Cutting is not necessary.

1.30- The General Electric

Perhaps General Electric got into the " Computer Business " without tremendous foresight, but the first steps in that direction were immensely successful. Starting with the Bank of America's Electronic Recording Method of Accounting (ERMA) system, combined with the development of Magnetic Ink Character Recognition (MICR) for the rapid processing of bank cheques, and backed by one of the largest corporations in the world, GE had the opportunity to effectively chase and catch IBM in the field data processing. Succeeding developments also portended well for the future but the continuing reluctance of the GE headquarters to support the Computer Department competitively with other companies whose one and only product was a computer eventually led to the sale of the operation to Honeywell Corporation. This is the story of those beginnings as seen and remembered by the first general manager of the Computer Department, H.R. (Barney) Old field. (1378 Exam).

171.What was General Electric trying to do with IBM
i) Share Magnetic Ink technology.
ii) Compete in data processing.
iii) Generate a coalition with IBM and Bank of America.
iv) Chase the ERMA technology.
172.With respect to its computer department, GE high officials
i) Tried to develop it to compete well with Honeywell.
ii) Encouraged Honeywell to eventually other companies.
iii) Held their operation well, in spite of their reluctance.
iv) Were not very eager to compete with single-product companies.
173.How was Ges computer department regarded
i) It was very promising.
ii) From the beginning, it was clear that it could not compete.
iii) It was the only product of GE.
iv) It was to grow to take over other parts of the company.

1.31- The Technology

My first contact with a calculator came in the autumn of 1934 when I purchased a technological marvel a ten inch slide rule, from the MIT Coop. Having mastered that device by my senior year, I was introduced to the beautiful and delicate Coradi waveform analyzer. I was never sure why it worked, but it had a polished glass ball, a low tech mouse if you will, gimbaled in two dimensions such that it could be guided over a tracing of a complex waveform and, after a number of passes, produce a frequency spectrum. We used it to analyze propeller vibrations as picked up by an accelerometer and reproduced on film by a recording oscilloscope. Later, as a research associate in Stark Draper's Instrumentation Laboratory, I was permitted to manipulate the Vennevar Bush differential analyzer, which we used to solve non-linear differential equations associated with wing flutter. I always stood in awe of these computing machines, never completely understood their inner workings, but became a reasonably skilled user. (1378 Exam).

174.The author expresses that
i) He slides from a 10 inch slope.
ii) Rules can slide when buying something.
iii) He bought something called a slide rule.
iv) MIT Corporation was selling marbles.
175.What does the author say about his works in school
i) He saw a waveform analyzer when he was doing his masters degree.
ii) In his senior year, he was developing a waveform analyzer.
iii) Calculators were just coming out.
iv) He first saw a certain waveform analyzer in his 4th year of school.
176.How does author relate to computing machines
i) He uses them for waveform analysis.
ii) He becomes an expert user without knowing their hardware.
iii) He is a research associate for developing analyzers.
iv) Uses computing machines in his research.

1.32- The Computer Aided Design

The evolution of computer aided design (CAD) tools has been instrumental in managing the complexity of IC designs and the design process. Currently, semiconductor chip design falls into three distinct phases: behavioral, logic synthesis, and physical synthesis CAD. With the rapid advances and acceptance of tools in each of these areas, CAD vendors are beginning to offer tools specific to a design phase. The continuing growth in silicon technologies and integration levels is also producing complete end user systems on a single chip. For instance, the Integrated Information Technology (IIT) VCP chips for desktop video contains two processors (a Mips-X and a digital signal processor), a memory array, and a graphic subsystem. The successful design of such a complex single chip system requires expertise in diverse technology areas such as signal processing, encryption, and analog and RF designs. These technologies are increasingly hard to find in a single design house. Thus, a fundamental shift is taking place in microelectronic system design. Once completely in house, the IC design process may now move through multiple design houses and ASIC and electronic design automation (EDA) vendors before reaching the fabrication line.

System design has moved from a vertical design process in which the design flowed through various phases in the same design house to a horizontal process in which different design houses may handle different phases. (1378 Exam).

177.One area that tool manufacturers concentrate on is

i) producing complete end user system.

ii) CAD tools for behavioral synthesis.

iii) CAD vendors.

iv) Beginning design phase.

178.Why is the VCP chip used as example

i) Because it requires multiple disciplines for its design.

ii) Because it is a design for logic synthesis.

iii) Because it uses a digital signal processor.

iv) Because Integrated Information Technology has bribed the author.

179.What is said about analog RF design

i) The successful design of it requires the VCP chip.

ii) Its design requires a diverse technology.

iii) It is used in the design of the VCP chip.

iv) It cannot be handled by CAD tools.

180.Design complexity requires that

i) Designs are done completely in house.

ii) A design is handled by several design houses.

iii) Designs move through multiple ASIC manufacturers.

iv) EDA vendors perform the fabrication.

1.33- Geometrical Hashing

This paragraph presents work in applied geometric hashing for efficiently accessing very large data-bases of stored geometric information. Originated in the mid- eighties at New York University's Courant Institute of Mathematical Sciences' this method emerged initially as a general scheme for carrying out model-based object recognition in computer vision. Geometric hashing permitted the detection of objects from a given model data- base in scenes, where additional clutter might be present and the objects might partially occlude each other.

The key observation was that a judicious choice of geometric invariants describing local scene features and proper encoding of geometric constraints inherent to rigid bodies let vision systems exploit the extremely efficient hashing methods for geometric data retrieval. Although easy to state, the problem of computer based object recognition is very difficult to solve in its general form. In fact, until recently, computer vision was included among computer science's Grand Challenges.

However, numerous successful applications have emerged for specific tasks and constrained environments. In the geometric hashing approach, performance does not degrade linearly with the addition of new items to the data-base; such linear slowdown characterized all previous techniques. Geometric hashing's indexing technique allows the speedy identification of relevant locations in the data-base while also obviating the need to sequentially search the entire data-base.

By using a redundant set of indices for each object, this technique effectively handles the partial occlusion problem. (1378 Exam).

181.Geometric hashing method

i) Is a method for moving geometrical objects in a picture.
ii) Is a method for identifying geometrical shapes.
iii) Carries out model-based objects.
iv) Is used for accessing large data-bases.

182.The geometric hashing method is particularly good when

i) Objects are being carried from one place to another.
ii) Geometrical shapes block each other in a computer vision.
iii) Detecting geometrical computers of a vision.
iv) Local scenes are being described.

183.Sequential search of a data-base is avoided by

i) Speedy identification of objects.
ii) Use of the geometric hashing method.
iii) Indexing geometry of relevant objects.
iv) Obviating the use of data-bases.

1.34- Alan Turing

Turing, Alan M., (b.June 23,1912,London. –d. June 7, 1954, Cheshire), was an English mathematician and logician who pioneered in the field of computer theory and who contributed important logical analysis of computer processes. The son of a British member of the Indian Civil Service, Turing studied at Sherborn school and at King's College Cambridge.

Many mathematicians in the first decades of the 20th century had attempted to eliminate all possible errors from mathematics by establishing a formal, or purely algorithmic, procedure for establishing truth. The mathematician Kurt Gödel threw up, an obstacle to this effort with his incompleteness theorem; he showed that any

useful mathematical axiom system is incomplete in the sense that there must exist propositions whose truth can never be determined (Un-decidable propositions). Turing was motivated by Gödel's work to seek an algorithmic method of determining where any given propositions were un-decidable, with the ultimate goal of eliminating them from mathematics. Instead, he proved that there cannot exist any such universal method of determination and, hence, that mathematicians will always contain un-decidable (as opposed to unknown) propositions.
To illustrate this point, Turing posited a simple device that proposed the fundamental properties of a modern computing system; a finite program, a large data-storage capacity, and a step-by-step mode of mathematical operation. Turing's work put to rest the hopes of David Hilbert and his school that all mathematical propositions could be expressed as set of axioms and derived theorems, He, later on, contributed in breaking the German Enigma code, design and construction of the Automatic Computing Engine (ACE), and the University of Manchester Automatic Digital Machine (MADAM). He also championed the theory that computers would be capable of human thought, and proposed a simple test, now known as the Turing test, to assess this capability. (1379 Exam).

184.Alan Turing proved that Gödel……….
i) Is right.
ii) May be wrong.
iii) Is an idiot.
iv) Was profound.

185.Turing was …… David Hilbert's belief
i) Against.
ii) Wrong about.
iii) Complicated with.
iv) Akin to.

186.Alan Turing had also some experience in………
i) Encryption.
ii) Cambridge.
iii) Manchester.
iv) Determinism.

187.Pick the right sentence
i) Gödel's work was incomplete, though algorithmic.
ii) Hilbert went to the same school as Turing.
iii) Mathematics cannot always be error free.
iv) Turing was capable of inhumane thoughts.

1.35- Gene Amdahl

As a graduate student in physics at the University of Wisconsin during the late 1940s, Gene Amdahl designed his first computer, built as the Wisconsin Integrally Synchronized Computer (WISC). He went on to become the "father " of IBM's System/360 and an industry leader in mainframe design. Though Amdahl's work has focused on computers that serve hundreds of concurrent users, he has also pioneered techniques and ideas that resonate throughout the industry.
For instance, Amdahl Corporation computers were the first to use virtually addressed catching, now standard in most architecture. Advocating uni-processors over multiprocessors, Amdahl also propounded what became known as Amdahl's law. Beyond these contributions to the evolution of computing, Amdahl's career

epitomizes the roller-coaster rid of high-tech business over the last four decades. After leaving IBM, Amdahl founded Amdahl Corporation, Trilogy Systems Corporation, Andor International, and Commercial Data Servers, where he is now chairman of the board.
In 1980, Amdahl was a charter recipient of the IEEE Computer Society Computer Pioneer award. In 1987, the Eckert-Mauchly Award Committee recognized him for his " outstanding innovations in computer architecture, including pipelining, instruction look ahead, and cache memory." Amdahl's other awards include the IEEE Computer Society W. Wallace McDowell Award, the AFIPS Harry Goode Award, the Data Processing Management Association Computer Science Man of the Year, and a place in the Information Processing Hall of Fame. He is a member of the National Academy of Engineering, a fellow of the IEEE, and a distinguished fellow of the British Computer Society. (1379 Exam).

189.The man who invented IBM's System 360 is now
i) Unemployed, but heads IEEE computer society.
ii) Dead.
iii) Chairman of Amdahl Corporation.
iv) Head of Commercial Data Servers.

190.Virtually addressed caching
i) Was invented by IBM under Mr. Amdahl.
ii) Was first used under supervision of Mr. Amdahl.
iii) Was first utilized by Amdahl Corporation.
iv) Because a required standard in architectures.

191.Mr. W. Wallace McDowell
i) Was awarded by the computer society.
ii) Is no one that we know about from this paragraph.
iii) Awarded Mr. Amdahl for his pipelining ideas.
iv) In addition, Mr. Harry Goode worked on awards for Mr. Amdahl.

192.The Eckert-Mauchly Award Committee recognized Mr. Amdahl for
i) Looking ahead into cache memory.
ii) Significant contributions in computer organization.
iii) His innovations in outstanding architectures.
iv) Being a recipient of the Pioneer Award.

1.36- The Modeling Language

The Unified Modeling Language (UML) is intended to consolidate the experience of the object-oriented (OO) community by providing a set of semantic modeling concepts and a corresponding notation that can provide a standard general-purpose modeling language for expressing most kind of models.
Its main advantage over other object oriented analysis and design notations is the opportunity to end the petty wars over minor differences in semantics and notation by adopting a broad consensus developed by a number of methodologists and vendors. UML contains some newer features, but its core is based on years of experience with several of the leading OO methods. Yes UML can be used on real projects today.
UML is not a tiny language, but are neither C++, Smalltalk, Java, nor Eiffel.
It needs to accommodate analysis and design, large and small projects, is compatible with many programming languages but dependent on none. In particular, it needs to embrace the systems of today (they are no longer in the future) that are inherently

concurrent, distributed, and multilingual. We have made UML as simple as possible subject to these needs, but we don't expect someone to learn it in a day.
We have structured the core concepts of UML to be straightforward, however, users of popular methods should learn enough in a day to continue working productively in UML. We feel that UML is better defined than any other comparable modeling language.
It has a self-referential meta-model (any general-purpose modeling language should be able to model itself) as well as a built-in constraint language for defining non-syntactic restrictions. We have tried to strike a balance between formality and pragmatism. People will find flaws, of course; nothing of this size is ever perfect, but that is no different from most software products.
We feel that the language is robust and can be repaired and extended easily, if the need arises. (1379 Exam).

193.The author is mainly
i) Narrating the history of UML.
ii) Comparing UML to other object oriented modeling languages.
iii) Arguing in defense of UML.
iv) Presenting a detailed objective analysis of UML.
194.The word " inherently " as used above is closest in meaning to which of the following
i) Apparently.
ii) Intrinsically.
iii) Internally.
iv) Interminably.
195.Which of the following can be inferred from the text?
i) All kinds of models can be expressed by UML.
ii) UML is used extensively in real projects.
iii) It is generally agreed that UML should become the standard for modeling.
iv) UML is able to model itself.
196.Which of the following is NOT mentioned in the passage?
i) UML's large size.
ii) UML's formal features.
iii) UML's ability to model concurrency and distribution.
iv) UML's shortcomings in modeling non-OO details.

Translate the following passages into Farsi

Passage #1: The Elements of Commerce

When you get down to the actual elements of commerce and commercial transactions, things get slightly more complicated because you have to deal with the details. However, these details boil down to a finite number of steps. The following list highlights all of the elements of a typical commerce activity. In this case, the activity is the sale of some product by a retailer to a customer:
If you would like to sell something to a customer, at the very core of the matter is the something itself. You must have a product or service to offer. The product can be anything from ball bearings to back rubs. You may get your products directly from a producer, or you might go through a distributor to get them, or you may produce the products yourself.

You must also have a place from which to sell your products. Place can sometimes be very ephemeral - for example a phone number might be the place. If you are a customer in need of a back rub, if you call "Judy's Backrubs, Inc." on the telephone to order a back rub, and if Judy shows up at your office to give you a backrub, then the phone number is the place where you purchased this service. For most physical products we tend to think of the place as a store or shop of some sort. But if you think about it a bit more you realize that the place for any traditional mail order company is the combination of an ad or a catalog and a phone number or a mail box.
You need to figure out a way to get people to come to your place. This process is known as marketing. If no one knows that your place exists, you will never sell anything. Locating your place in a busy shopping center is one way to get traffic. Sending out a mail order catalog is another. There is also advertising, word of mouth and even the guy in a chicken suit that stands by the road waving at passing cars!
You need a way to accept orders. At Wal-mart this is handled by the check out line. In a mail order company the orders come in by mail or phone and are processed by employees of the company.
You also need a way to accept money. If you are at Wal-mart you know that you can use cash, check or credit cards to pay for products. Business-to-business transactions often use purchase orders. Many businesses do not require you to pay for the product or service at the time of delivery, and some products and services are delivered continuously (water, power, phone and pagers are like this). That gets into the whole area of billing and collections.
You need a way to deliver the product or service, often known as fulfillment. At a store like Wal-mart fulfillment is automatic. The customer picks up the item of desire, pays for it and walks out the door. In mail-order businesses the item is packaged and mailed. Large items must be loaded onto trucks or trains and shipped.
Sometimes customers do not like what they buy, so you need a way to accept returns. You may or may not charge certain fees for returns, and you may or may not require the customer to get authorization before returning anything.
Sometimes a product breaks, so you need a way to honor warranty claims. For retailers this part of the transaction is often handled by the producer.
Many products today are so complicated that they require customer service and technical support departments to help customers use them. Computers are a good example of this sort of product. On-going products like cell phone service may also require on-going customer service because customers want to change the service they receive over time. Traditional items (for example, a head of lettuce), generally require less support that modern electronic items.
You find all of these elements in any traditional mail order company. Whether the company is selling books, consumer products, information in the form of reports and papers, or services, all of these elements come into play.

Passage #2: Networking Basics

Think of a hub as a four-way intersection where everyone has to stop. If more than one car reaches the intersection at the same time, they have to wait for their turn to proceed. Imagine that each vehicle is a packet of data waiting for an opportunity to continue on its trip.
Now imagine what this would be like with a dozen or even a hundred roads intersecting at a single point. The amount of waiting and the potential for a collision increases significantly. But wouldn't it be amazing if you could take an exit ramp from any one of those roads to the road of your choosing? That is exactly what a

switch does for network traffic. A switch is like a cloverleaf intersection -- each car can take an exit ramp to get to its destination without having to stop and wait for other traffic to go by.
A vital difference between a hub and a switch is that all the nodes connected to a hub share the bandwidth among themselves, while a device connected to a switch port has the full bandwidth all to itself. For example, if 10 nodes are communicating using a hub on a 10-Mbps network, then each node may only get a portion of the 10 Mbps if other nodes on the hub want to communicate as well. But with a switch, each node could possibly communicate at the full 10 Mbps. Think about our road analogy. If all of the traffic is coming to a common intersection, then each car it has to share that intersection with every other car. But a cloverleaf allows all of the traffic to continue at full speed from one road to the next.
In a fully switched network, switches replace all the hubs of an Ethernet network with a dedicated segment for every node. These segments connect to a switch, which supports multiple dedicated segments (sometimes in the hundreds). Since the only devices on each segment are the switch and the node, the switch picks-up every transmission before it reaches another node. The switch then forwards the frame over the appropriate segment. Since any segment contains only a single node, the frame only reaches the intended recipient. This allows many conversations to occur simultaneously on a switched network.
Switching allows a network to maintain full-duplex Ethernet. Before switching, Ethernet was half-duplex, which means that data could be transmitted in only one direction at a time. In a fully switched network, each node communicates only with the switch, not directly with other nodes. Information can travel from node to switch and from switch to node simultaneously.
Fully switched networks employ wither twisted-pair or fiber-optic cabling, both of which use separate conductors for sending and receiving data. In this type of environment, Ethernet nodes can forgo the collision detection process and transmit at will, since they are the only potential devices that can access the medium. In other words, traffic flowing in each direction has a lane to itself. This allows nodes to transmit to the switch as the switch transmits to them -- it's a collision-free environment. Transmitting in both directions can effectively double the apparent speed of the network when two nodes are exchanging information. If the speed of the network is 10 Mbps, then each node can transmit simultaneously at 10 Mbps.

Passage #3: Flash Memory

The electrons in the cells of a Flash-memory chip can be returned to normal ("1") by the application of an electric field, a higher-voltage charge. Flash memory uses in-circuit wiring to apply the electric field wither to the entire chip or to predetermined sections known as blocks. This erases the targeted area of the chip, which can then be rewritten. Flash memory works much faster than traditional EEPROMs because instead of erasing one byte at a time, it erases a block or the entire chip, and then rewrites it.
You may think that your car radio has Flash memory, since you are able to program the presets and the radio remembers them. But it is actually using Flash RAM. The difference is that Flash RAM has to have some power to maintain its contents, while Flash memory will maintain its data without any external source of power. Even though you have turned the power off, the car radio is pulling a tiny amount of current to preserve the data in the Flash RAM. That is why the radio will lose its presets if

your car battery dies or the wires are disconnected. In the following sections, we will concentrate on removable Flash memory products.
While your computer's BIOS chip is the most common form of Flash memory, removable solid-state storage devices are becoming increasingly popular. SmartMedia and Compact_Flash cards are both well-known, especially as "electronic film" for digital cameras. Other removable Flash memory products include Sony's Memory Stick, PCMCIA memory cards, and memory cards for video game systems such as Nintendo's N64, Sega's Dreamcast and Sony's PlayStation. We will focus on SmartMedia and CompactFlash, but the essential idea is the same for all of these products. Every one of them is simply a form of Flash memory.

Passage #4: Microprocessor

A microprocessor -- also known as a CPU or central processing unit -- is a complete computation engine that is fabricated on a single chip. The first microprocessor was the Intel 4004, introduced in 1971. The 4004 was not very powerful -- all it could do was add and subtract, and it could only do that 4 bits at a time. But it was amazing that everything was on one chip. Prior to the 4004, engineers built computers wither from collections of chips or from discrete components (transistors wired one at a time). The 4004 powered one of the first portable electronic calculators.
The first microprocessor to make it into a home computer was the Intel 8080, a complete 8-bit computer on one chip, introduced in 1974. The first microprocessor to make a real splash in the market was the Intel 8088, introduced in 1979 and incorporated into the IBM PC (which first appeared around 1982). If you are familiar with the PC market and its history, you know that the PC market moved from the 8088 to the 80286 to the 80386 to the 80486 to the Pentium to the Pentium II to the Pentium III to the Pentium 4. All of these microprocessors are made by Intel and all of them are improvements on the basic design of the 8088. The Pentium 4 can execute any piece of code that ran on the original 8088, but it does it about 5,000 times faster!
A chip is also called an integrated circuit. Generally it is a small, thin piece of silicon onto which the transistors making up the microprocessor have been etched. A chip might be as large as an inch on a side and can contain tens of millions of transistors. Simpler processors might consist of a few thousand transistors etched onto a chip just a few millimeters square.
The date is the year that the processor was first introduced. Many processors are re-introduced at higher clock speeds for many years after the original release date.
Transistors is the number of transistors on the chip. You can see that the number of transistors on a single chip has risen steadily over the years.
Microns is the width, in microns, of the smallest wire on the chip. For comparison, a human hair is 100 microns thick. As the feature size on the chip goes down, the number of transistors rises.