Operating Systems & Networking
- Student Notes

Directions:
Fill in the blanks.

Operating Systems Segment

1. Computers
• Are ______________ able to store, retrieve and process information
• Can be classified by size and power
• Include the following characteristics:
  – respond to specific instructions in a precise manner
  – can perform a ______________ set of instructions
  – able to store and retrieve large amounts of information
  – use operating systems to function effectively

2. Computers
• Break down into the five main following types:
  – personal computer (PC): small, single-user computer; used in homes and businesses; based on a ______________
    • desktop, laptop
  – work station: ______________, single-user computer; more powerful microprocessor than PCs

Microprocessor: the master control circuit of a computer

3. Computers
• Break down into the five main following types:
  – minicomputer: a multi-user computer designed to handle hundreds of users at the same time
  – mainframe: a powerful, multi-user computer; can support hundreds or thousands of users ______________
  – supercomputer: an extremely fast computer; can perform hundreds of millions of ______________ every second
4. Overview

Operating Systems

- Single-User, Single-Task
- Single-User, Multi-Tasking
- Unix
- Linux
- PDA
- Windows
- Macintosh
- GUI

Machinery
Scientific Tools
Industrial Instruments

5. Operating Systems

- Are programs acting as ____________ between a computer user and the computer itself
- Control and manage all other programs a computer contains
- Are the master program making everything else run
- Can be considered the ____________ on a computer linking the hardware, software and the computer user

Hardware: the physical and mechanical components of a computer such as: monitor, mouse, chips, keyboard, etc.
Software: programs directing the operation of computers; instructions for a computer

6. Operating Systems

- Performs basic ____________ to make sure the computer works correctly, most importantly include:
  - process management
  - ____________ management
  - file management
  - hardware management
  - security management
7. Process Management
• Requires the operating system to complete the following tasks:
  – process creation and ______________
  – process suspension and resumption
  – process ______________ and communication

8. Memory Management
• Requires the operating system to:
  – keep track of which parts of ______________ are currently being used and who is using them
  – determine which processes to load when memory space becomes available
  – allocate and ______________ memory space when necessary

9. File Management
• Requires the operating system to:
  – create and delete files
  – create and delete ______________
  – support primitives for manipulating files and directories
  – map files onto ______________ storage
  – backup files on stable storage media

10. Hardware Management
• Requires the operating system to:
  – monitor the status of each device
  – enforce ______________ to determine which process will get device time and how long for
  – allocate and de-allocate ______________

11. Security Management
• Requires the operating system to:
  – distinguish between authorized and ______________ users
  – only allow authorized users to access the files and resources
  – provide a means of ______________
  – specify the controls to be imposed
12. Operating Systems
   • Include the following ____________ general types:
     – real-time operating systems (RTOS)
     – single-user, single task operating systems
     – single-user, ____________ operating systems
     – multi-user operating systems

13. Real-Time Operating Systems
   • Are used to control the following:
     – machinery
     – ____________ tools
     – industrial instruments
   • Do not allow the user to have much control over the system
   • Are used for real-time applications such as: ____________, mobile phones, spacecrafts, etc.

   • Allow users to do only one thing at any given time
   • Include Personal Digital Assistants or ____________
     – small, ____________ computers only allow users to operate one application at a time

15. Single-User, Multi-Tasking Operating Systems
   • Are the most ____________ type of system found on PCs
   • Allow the user to run several computer ____________ at the same time
   • Include Windows® (Microsoft®) and Macintosh® (Apple®) platforms

16. Windows®
   • Was created by the ____________ Corporation for use on PCs
   • Is a single-user, multi-tasking operating system
   • Previously needed to be downloaded after a computer was purchased
   • Pre-installed on almost all new personal computers
   • Is estimated to run on around ____________ of all PCs
   • Utilizes a graphical user interface so users do not have to learn difficult demands
17. **Graphical User Interface (GUI)**
   - Allows users to operate computers without knowing the language used to __________ with an operating system
   - Makes computers much more __________
   - Eases the complications of operating a computer

18. **Graphical User Interface (GUI)**
   - Utilizes the following tools:
     - pointer: a __________ (usually an arrow) on a computer screen used to select objects
     - pointing device: an object such as a mouse used for pointing
     - icons: small pictures on a computer screen representing programs and applications
     - desktop: an area on a __________ screen where icons are displayed
     - windows: divide the screen into different areas so several programs can run at the same time
     - menus: allow users to select commands from a list of choices

19. **Macintosh® (Mac OS)**
   - Is an operating system created by __________
   - Is a single-user, multi-tasking operating system
   - Also uses __________ to help ease the difficulty level for users
   - Allows users to run old Macintosh® applications through the system
   - Application: a computer program performing a specific task

20. **Multi-User Operating Systems**
   - Allow multiple users to __________ use the programs on a single computer
   - Should only allow users who have the necessary knowledge to use the system
   - Are complex systems requiring a lot of upkeep and __________
   - Include Unix® and Linux® operating systems
21. **Unix®**
   - Is a multi-user, multi-tasking operating system
   - Designed to be a small, ____________ system for use by computer programmers
   - Not very user-friendly for the average, everyday user
   - GUIs have recently been created to help make it easier to use for ____________ users

   Computer Programmer: a person who designs, writes and installs computer programs and applications

22. **Linux®**
   - Is a variation of the Unix operating system
   - Originally created by a student at the University of ____________ named Linus Torvalds
   - Is a multi-user, multi-tasking operating system
   - Allows source code to be free to the public so it can be re-created by others with necessary ____________

   Source Code: the tags and instructions developed by the creator explaining how the system was created

**Networking Segment**

1. **Network**
   - Is a system for communication between two or more computers
   - Enables users to share ____________ and devices through the system
   - Allows users to exchange software, hardware and other data
   - Uses a cable or ____________ connection to run

2. **Wireless Connections**
   - Connect computers without the use of wires and cables
   - Uses ____________ waves to transmit information
   - Are also used for telephones not ____________ to the wall
     - example: cordless phones and cellular phones

   Electromagnetic Waves: a method of travel for information from computer to computer; consists of light waves, radio waves, etc.
3. Networks
   • Break down into the following main types:
     – Local Area Network
     – Wide Area Network
     – ___________ Area Network
     – Controlled Area Network
     – ___________ Area Network

4. Local Area Networks (LAN)
   • Are local, privately owned networks
   • Have a high speed and low error rate
   • Are able to be measured in meters because of their small ___________ size
   • Typically means the computers in the ___________ are within the same building or office

Error Rate: The number of times an area network does not function properly compared to the total number of times the network is accessed

5. Wide Area Networks (WAN)
   • Are networks providing ___________ between computers in multiple locations
   • Cover a significantly larger area than ___________
   • Can be used to connect different office locations of a large company
   • Consist of several LANs linked together to create a larger network

6. Metropolitan Area Networks (MAN)
   • Cover an area the size of an average to large city
   • Are high-speed networks designed to link together ___________ size areas, campuses or school districts
   • Fall ___________ the size of LANs and WANs
   • Cover about 80 kilometers worth of distance

7. Controller Area Networks (CAN)
   • Are used for real-time control operations
     – temperature, time, etc.
   • Was originally developed for use in ___________
   • Has excellent error protection to prevent problems
   • Sends shorter ___________ than other networks
8. Personal Area Networks (PAN)
- Usually cover the small area around a user’s ______________
- Allow users to transfer files and gain access to printers and other nearby hardware
- Cover a range of up to ______________ in distance
- Used to connect devices a single person uses with their computer

9. Internet
- Is a worldwide, publicly accessed network
- Allows interconnected computer networks to ______________data back and forth
- Enables contact between companies, individuals, academic institutions, etc.
- Consists of approximately 60,000 independent networks and 350 million active users
- Is ______________ in size each year

10. Network Messaging
- Allows users to send ______________ from one computer to another through the Internet
- Is a quick, easy and efficient way to send and retrieve data
- Utilizes programs such as
  - instant messaging programs
  - online ______________
  - e-mail

11. Servers
- Allow multiple users to access the same equipment such as fax machines, printers or common ______________stored in one central place
- Are used so several people can access the Internet and other computer programs simultaneously
- Can be used interchangeably with the names ______________ or network servers
- Store an abundant amount of information
- Manage the resources of a network of computers
12. Servers

13. Server Size
- Depends on the size of a home or ______________ in which it will run
- Increases in size as the speed also increases and vice versa
- Increases and decreases along with the number of users
- Can be as small as a ______________ or as large as a whole room

14. Firewalls
- Serve as a security device between a computer and Internet sites or between multiple ______________ networks
- Inspect network traffic passing between computer networks
- Shield networks from unauthorized visits
- Can also restrict unwanted _____________ from flowing outside of a network

15. Transmission Control Protocol/Internet Protocol (TCP/IP)
- Serves as a unique identification for a computer on a network
- Helps ______________ individual computers
- Is a 32 bit code made up of four subsets of numbers
- Determines where ______________ needs to be delivered
- Serves the same purpose as a street address
  - example: (172.16.122.204)

16. Network Hardware
- Includes:
  - network router
  - network ______________ card
  - network switches
  - network ______________
17. Network Router
- Is a hardware device connected to multiple __________ for different networks through an interface
- Is a type of device which acts as the central point to direct __________ on the Internet
  - it not only selects the best path to route a message, but also translates information from one network to another

18. Network Interface Card
- Is a device which provides the __________ connection between the network and the computer workstation
- Is a major factor in determining the speed and performance of a network
- Can be internal or external
  - most network __________ are internal and included in the purchase of the computers

19. Network Switch
- Is a device providing a central connection point for cable from the __________
- Electrically amplifies the signal as it moves from one device to another
- Can immediately __________ network traffic in most networks

20. Network Bridge
- Is a device dividing traffic on a local area network
- Separates the LAN into several different __________
- Is also responsible for filtering data by determining the data __________ or discarding unnecessary data

21. Network Troubleshooting
- Involves:
  - verifying the network adapter is properly installed and detected by the computer with no conflicts
    • open the __________ and verify there are no errors
    • if conflicts exist, try letting the operating system re-detect and install the network card
    • if the operating system re-detects the card but does not find the drivers, __________ the latest network card driver
22. Network Troubleshooting
- Involves:
  - verifying connection
    - when working on a wired network, make sure the network cable is properly connected and verify the LEDs next to the network jack are properly_____________
    - when working on a wireless network, look for the computer’s_____________ and make sure it is on; make sure the correct Wi-Fi hotspot is used

23. Network Troubleshooting
- Involves:
  - verifying the network card is capable of_____________itself
    - use the ping command and see whether replies from the network card is received
    - if an error is received, or the_____________ fails, then the network card is not physically installed correctly or it is defective

24. Network Troubleshooting
- Involves:
  - making sure the computer can connect to the router correctly
    - determine the router’s address by looking at the_____________address
    - if no reply is received from the_____________, either the router is not set up properly, or the connection between the router and the computer is not correct

25. Network Troubleshooting
- Involves:
  - making sure the Internet service provider is working properly
    - wait for a few minutes to make sure it is not a_____________outage
    - unplug the power cables to the router and modem and leave them disconnected for_____________, and then see if your router is pinged
    - contact the Internet service provider to make sure there is no problem on their end
Information Systems

1. Information Systems
   • Are often referred to as _______________Information Systems (MIS)
   • Refer to the entire process from gathering to using information to be utilized in an _______________
   • Provide information which can then be used in various areas of the organization

2. Information
   • Is used at various levels within an organization
     − management & operations
       • decision making, business _______________, goals
     − accounting & finance
       • bookkeeping, financial statements
     − sales & _______________
       • customer/consumer demographics
     − human resources

3. Business Planning
   • Will inherently consist of gathering, processing and ________ information
   • After the _______________planning stage information will be more actively USED

4. Information System Issues
   • Include having to perform the following:
     − increasing security on computers
     − decreasing _______________/costs
     − decreasing complexity of _______________

5. Equipment & Supplies
   • Are used in each _______________ of a company
     − Also will vary depending upon company industry type and/or size
6. Equipment & Supplies
   • Are ______________ on the purpose of the business
   • Will include both ______________ and software

7. Equipment & Supplies
   • Hardware examples include:
     – computers/monitors
     – printers
     – copiers
     – ______________
     – telephones/mobile phones
     – wireless ______________ devices
     – external storage devices

8. Equipment & Supplies
   • Software examples include:
     – security software
     – ______________ system
     – product specific software such as for photo or video editing
     – accounting and ______________ software
     – business documents software

9. Maintenance & Updates
   • Software
     – security updates are top priority and should be carried out frequently
     – other software may have free ______________ available online or updates for a fee
     – some types of software will have to be ______________ in order to update
10. Maintenance & Updates
• Hardware
  – printers (ink)
  – ____________/scanners
  – phones/phone lines
  – wireless devices
• Should include regularly ____________ parts, firmware or software updates to keep devices working properly

11. Maintenance Schedule
• Keep detailed records to maintain warranties
• Example: printer
  – date of ____________
  – make and model
  – number of pages printed
  – previous ____________ calls
  – contact information of service provider

12. Information System Tools
• Include:
  – transaction processing system (TPS) – record and document all of a business’s recurring and routine ____________
  – operating information system (OIS) – plan and schedule production and ____________ functions
  – decision support system (DSS) – make use of computing tools, mathematical and scientific modes of its analysis

13. Information System Security
• Involves protecting a business or organization’s data assets
• Professionals test, ____________ and maintain software and hardware used to protect information
• Managers might coordinate system-wide ____________ to increase security
14. Scanners
• Are external devices used to transfer data to a computer in an image form
• Have ___________ advanced over the past ten years
• Consist of two types:
  – flatbed which scans paper documents, books, and photographs
  – ________________ which can only scan flat pieces of paper

15. Parts of a Scanner

16. Steps of Operating a Scanner
• Include the following:
  – turning the scanner on
  – raising the scanner lid
  – placing the image to be _____________ face down on the bed, aligning properly, and then closing the lid
  – selecting the proper program on your computer, and selecting the ‘Scan’ or _____________ function to begin the scan
  – select the location where you want to save your scan