THE UNIVERSITY OF ZAMBIA

School of Natural Sciences

Department of Computer Science

CSC 2101
COMPUTER SYSTEMS

FINAL EXAMINATION

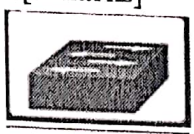
Date: 22th NOVEMBER, 2021
Time: 09:00 – 12:00 HOURS
Duration: 3 Hours
Venue: SPORTS HALL

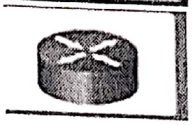
INSTRUCTIONS

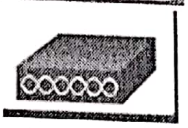
1. This exam paper has **Seven (7)** questions.
2. Answer **ANY FIVE (5)** questions.
3. Clearly identify the problem being solved.
4. Use the marks as a guide to the detail required in your answers while keeping your answers concise and relevant.

QUESTION ONE

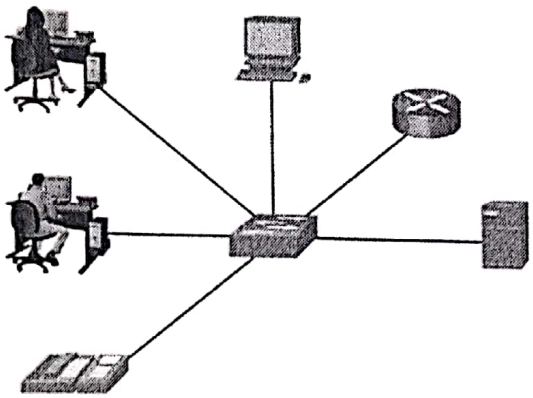
1. Computer networks connect devices and users to one another.
   a. What is the role of an intermediary device in a network? **[1 mark]**
   b. For each of the following, name the intermediary device and state its function.**[3 marks]**

i. 

ii. 

iii. 

   c. Consider the following network diagram. State the network topology name and outline its characteristics. **[3 marks]**



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2. The TCP/IP model consists of layers that perform functions necessary to prepare data for transmission over a network.
   a. What does the acronym TCP/IP stand for? **[1 mark]**
   b. Outline the three basic operations of reliability with respect to TCP. **[3 marks]**
   c. Name the layers on the TCP/IP model and identify the layers where TCP and IP protocols are located. **[3 marks]**
3. When you use a web browser, you can have more than one tab open at a time. Explain how your computer knows which browser tab to deliver the web content to. **[3 marks]**
4. Distinguish between DHCP and DNS servers. **[3 marks]**

QUESTION TWO

1. All motherboards need BIOS to operate.
   a. What does the acronym BIOS stand for? **[1 mark]**
   b. Outline three (3) settings/features that are identified by BIOS. **[3 marks]**
   c. Name the component that is used to save BIOS settings. **[1 mark]**
   d. *LoJack* is a BIOS security feature that consists of two programs.
      i. Name the two (2) programs. **[2 marks]**
      ii. State the three (3) functions that a device owner can perform by using LoJack. **[3 marks]**
2. Match the term to the description: Noise, Spike, Power surge, Blackout, Brownout. **[4 marks]**
   a. Can be caused by a downed power line.
   b. Occurs when electrical circuits are overloaded.
   c. Sudden increase in voltage that exceeds 100 percent of the normal voltage on a line.
   d. Reduced voltage level of AC power that lasts for a period of time.
   e. Interference from generators and lightning.
   f. Can be caused by a damaged transformer.
   g. Can be caused by lightning strikes.
   h. Lasts for a few nanoseconds, or one-billionth of a second.
3. Distinguish between Pixel and Dot Pitch computer monitor terms. **[2 marks]**
4. Distinguish between Stripping and Mirroring in RAID storage technology. **[2 marks]**
5. Distinguish between Thick and Thin client computers. **[2 marks]**

QUESTION THREE

1. Organisations, both large and small, are investing heavily in virtualisation computing.
   a. Outline four (4) advantages of server virtualisation. **[4 marks]**
   b. The hypervisor, also called the Virtual Machine Manager (VMM), is the brain of virtualization.
      i. Why is a hypervisor termed the brain of virtualization? **[1 mark]**
      ii. With the aid of a diagram, distinguish between a Type 1 (native) hypervisor and Type 2 (hosted) hypervisor. **[5 marks]**
2. Organisations, both large and small, are investing heavily in cloud computing.
   a. Explain how each of the following cloud services operates. **[6 marks]**
      i. Software as a Service (SaaS)
      ii. Platform as a Service (PaaS)
      iii. Infrastructure as a Service (IaaS)
   b. Outline four (4) characteristics of cloud computing models. **[4 marks]**

QUESTION FOUR

1. Identify the steps in the troubleshooting process of computer problems, including a brief description and **ONE** example activity for each step. Use the table format below to organise your answer. **[12 marks]**

Step	Description	Activity

2. Answer **True** or **False**
   a. Less computer downtime is a benefit of doing frequent preventive maintenance on a desktop PC. true
   b. Fewer security breaches are a benefit of doing frequent preventive maintenance on a desktop PC. true
   c. Longer equipment life is a benefit of doing frequent preventive maintenance on a desktop PC. true
   d. Fewer spam emails is a benefit of doing frequent preventive maintenance on a desktop PC. false
   e. System access to more RAM is a benefit of doing frequent preventive maintenance on a desktop PC. false
   f. Elimination of hardware component failure is a benefit of doing frequent preventive maintenance on a desktop PC. false
   g. Cost saving is a benefit of doing frequent preventive maintenance on a desktop PC. true
   h. Elimination of updating operating software is a benefit of doing frequent preventive maintenance on a desktop PC. false
   i. A technician would require the use of an anti-static wrist strap during preventive maintenance on a desktop PC. true
   j. A technician would require the use of a lint-free cloth during preventive maintenance on a desktop PC. true
   k. A technician would require the use of a can of compressed air during preventive maintenance on a desktop PC. true
   l. A technician would require the use of cotton swabs during preventive maintenance on a desktop PC. false
   m. A technician would require the use of an industrial vacuum cleaner during preventive maintenance on a desktop PC. false
   n. A technician would require the use of a screw driver during preventive maintenance on a desktop PC. true
   o. A technician would require the use of a hammer during preventive maintenance on a desktop PC. false
   p. A technician would require the use of a duster during preventive maintenance on a desktop PC. true

QUESTION FIVE

1. Answer **True** or **False. [5 marks]**
   a. iOS allows both automatic and scheduled Antivirus scans. False
   b. Running apps in a sandbox helps mitigate damage to mobile devices by malicious software. True
   c. Rooting is a method for removing restrictions on modifying code on an iOS device. False
   d. Jailbreaking exploits vulnerabilities on iOS devices and is completely reversible. False
   e. Updates and patches for Android devices are not released as one package for all devices. False
   f. The swipe lock is considered the most secure method of preventing unauthorised access to a mobile device. False
   g. Requiring the user to draw a pattern on the careen with their finger is a feature of the fingerprint lock. False
   h. Some mobile devices can be unlocked by scanning a user's facial features. True
   i. The iOS Erase Data feature will delete all data on the device after 3 failed passcode attempts. True
   j. iOS devices store passcodes in plain text in flash memory. False
2. State the function performed by each of the following CLI Commands. **[5 marks]**
   a. cp copy
   b. mkdir new dir
   c. rm
   d. pwd
   e. cd change direct
3. A good change management process can prevent business functions from being negatively impacted by the updates, upgrades, replacements, and reconfigurations that are a normal part of IT operations.

   Identify the steps in a typical change management process, including **TWO** example questions for each step. Use the table format below to organise your answer. **[10 marks]**

Step	Question

QUESTION SIX

1. Distinguish between a virus and a trojan horse. **[2 marks]**
2. Outline the seven-step best practice procedure for malware-removal. **[7 marks]**
3. Explain how each of the following types of TCP/IP attacks works. **[3 marks]**
   a. Denial of service

b. Spoofing
c. DNS poisoning

4. One of the first tasks of a technician is to identify a customer's problem. Explain each of the following general rules for talking with customers. **[3 marks]**
   a. Know
   b. Relate
   c. Understand
5. Outline the five major phases of a disaster recovery plan. **[5 marks]**

QUESTION SEVEN

1. Electrostatic Discharge (ESD) can cause permanent damage to electrical components of a computer.
   a. Explain how ESD is caused? **[1 mark]**
   b. Approximately how many volts of static electricity must build up before a person can feel ESD? **[1/2 mark]**
   c. Approximately how many volts of static electricity can damage a computer component? [**1/2 mark**]
   d. Outline four (4) recommendations to help prevent ESD damage. **[2 marks]**
2. The computer case is an important component of a computer.
   a. Outline any three (3) functions of computer cases **[3 marks]**
   b. Mention two (2) other terms used to refer to computer cases. **[1 mark]**
3. The power supply includes several different connectors, which are said to be *"keyed"*.
   a. What does the term *keyed* mean? **[1 mark]**
   b. Name the component powered by each of the connectors listed below.**[3 marks]**
      i. A 20-pin or 24-pin slotted connector
      ii. Molex keyed connector
      iii. Berg keyed connector
4. Distinguish between Pin Grid Array (PGA) and Land Grid Array (LGA) CPU architectures. **[2 marks]**
5. Distinguish between the Northbridge and Southbridge motherboard chipsets. **[2 marks]**
6. Distinguish between active and passive cooling solutions in computers. [**2 marks**]
7. Distinguish between LCD and LED monitor technologies in computers. [**2 marks**]

The End