

SIR ARTHUR LEWIS COMMUNITY COLLEGE

FACULTY OF ENGINEERING

ACADEMIC YEAR (2024/2025) - SEMESTER ONE

END OF SEMESTER EXAMINATION

LECTURER(S)	:	Mr Shane Joseph
PROGRAMME TITLE	:	Computer Systems Engineering
COURSE TITLE	:	Internet Applications
COURSE CODE	:	CIT224
LEVEL	:	Associate Degree/Year Two
PAPER	:	Two
DATE	:	Wednesday, 7th May 2025
COMMENCEMENT TIME	:	9:00a.m.
DURATION	:	Two (2) hours
INVIGILATOR(S)	:	D. Jn Baptiste (Chief), C. Mccann, E. Thomas, J. Charlemagne & K. Emmanuel
ROOM(S)	:	LFT-1R-05

GENERAL INFORMATION AND INSTRUCTIONS

- This paper consists of one (1) Section with ten (10) short answer questions. You are required to answer ALL questions on the foolscap provided.
- Students must produce sufficient working steps, to justify solution.
- Write legibly in blue or black ink. Please number your responses accurately.
- The number in the brackets “()” next to each question are the marks allocated.
- Marks are awarded accordingly.
- Students must sign **IN** and **OUT** on the examination class list.
- Students must **not** write their names on their answer sheets, only their ID number.
- Students are reminded to read **all** questions and instructions in each section very carefully.
- Please number your responses accordingly.

DO NOT TURN THIS COVER SHEET UNTIL

YOU ARE TOLD TO DO SO!!!

Short Answer Questions

You are required to answer ALL questions on the foolscap provided.

Question One (12 Marks)

- (A) What is "an internet", what is "the Internet"? (4 marks)
- (B) One similarity between the telephone network and the internet is that they both are made of interconnections of small networks. Give two differences between them. (4 marks)
- (C) Define the following terms: (4 marks)
- i. Browser
 - ii. Web Server
 - iii. IP address
 - iv. ISP

Question Two (10 marks)

- (A) Every computer that is connected to the Internet is part of a Wide Area Network. Give two characteristics of a WAN (2 marks)
- (B) Networks can have both a physical and logical topology. Briefly explain each topology type. (2 marks)
- (C) With regards to type of address and use, explain a logical address and a physical address. (4 marks)
- (D) Indicate the layer of the OSI model the following Internetworking devices operate at.
Repeater and Bridge. (2 marks)

Question Three (10 Marks)

- (A) Listed below are the functions of each layer of the TCP/IP model. For each function “i” to “iv” state the layer responsible. (4 marks)
- i. Determines the best path through the network.
 - ii. Represents data for the user plus encoding and dialog control.
 - iii. Controls the hardware devices and media that make up the network.
 - iv. Supports communications link between diverse devices across the network.
- (B) Give the TCP/IP protocol assigned to the following Ports: 25, 110, (2 marks)
- (C) Indicate if the following TCP/IP protocols are UDP or TCP: (2 marks)
- i. DHCP
 - ii. FTP
- (D) If we have a website running on IP address 41.199.222.3, what would be the socket corresponding to the HTTP server for that site? (1 mark)
- (E) Just as the IP address identifies the device, The network port identifies what? (1 mark)

Question Four

(15 Marks)

- (A) Give two benefits of subnetting an IP Network. **(2 marks)**
- (B) **With an IP Address:** 196.163.111.0 and **subnet mask:** 255.255.255.192
 - i. Write the address in CIDR notation. **(1 mark)**
 - ii. Determine the number of possible subnets. **(1 mark)**
 - iii. Determine the number of useable Hosts per subnet. **(1 mark)**
 - iv. What is the range of usable IP addresses in the subnet **196.163.111.64**? **(2 marks)**
 - v. What is the broadcast address for the subnet **196.163.111.128**? **(1 mark)**
 - vi. What is the subnet address for the host with the IP address **196.163.111.200**? **(1 mark)**
 - vii. What is the **Network address** and **broadcast address** before subnetting? **(2 marks)**
 - viii. If you need to create 8 subnets from the IP address **196.163.111.0** what will be the subnet mask? **(1 mark)**
- (C) What is NAT? **(1 mark)**
- (D) Give the two key functions of NAT. **(2 marks)**

Question Five

(10 Marks)

- (A) Give the names of the DNS servers numbered 1- 4 in the diagram in *Figure 1*. **(4 marks)**

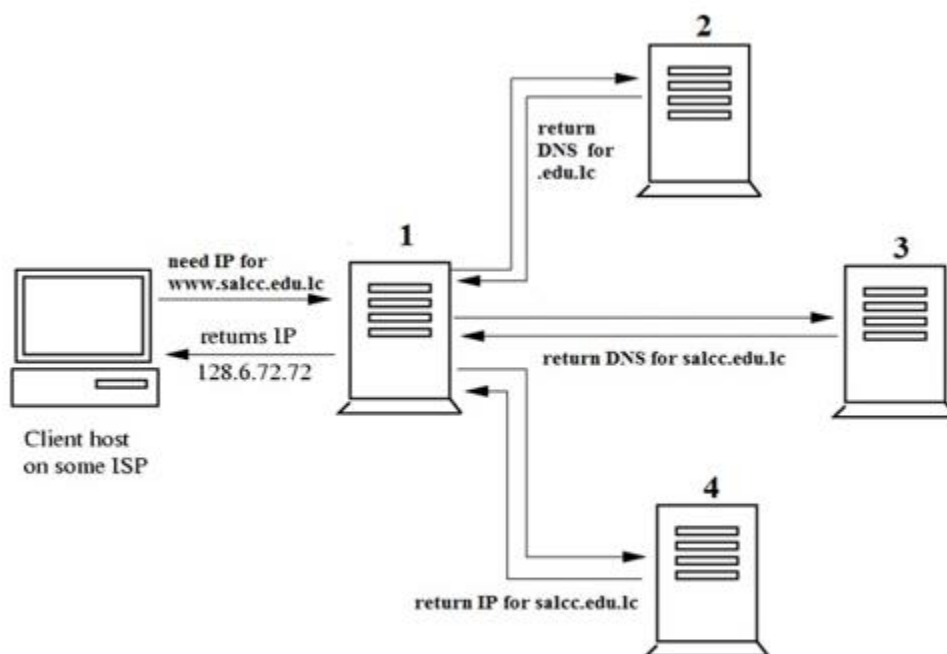


Figure 1

- (B) Briefly explain how a Recursive and an Iterative query works. **(4 marks)**
- (C) DNS servers are usually replicated. Give two (2) advantages of DNS replicas. **(2 marks)**

Question Six**(15 Marks)**

- (A) In a cloud computing system, there's a significant workload shift. Explain this statement. **(2 marks)**
- (B) Give two (2) advantages of Cloud computing to an Organization **(2 marks)**
- (C) Give one (1) general concern of Cloud computing **(1 mark)**
- i. A network engineer is looking for a provider that will allow her to move her organization's servers, routers, firewalls, and switches to the cloud. This provider would essentially act as her organization's virtual data center. Briefly describe the cloud service provider this network engineer needs to find? **(2 marks)**
 - ii. A CEO has requested that his IT department find a new accounting software. He would prefer that the accounting software doesn't need to be installed locally on his machine, since he often switches between multiple devices. He would like the program to simply be accessible via a Web browser on any device while he has an Internet connection. Briefly describe the cloud service this IT department should be looking at? **(2 marks)**
 - iii. Jamie is a software developer. She is great at writing code, but she doesn't know much about setting up or managing networks and servers. Jamie just wants to be able to write her code and manage her application while someone else owns and maintains the servers and networking equipment. Briefly describe the type of cloud service provider that would work best for Jamie? **(2 marks)**
- (D) A very large enterprise has decided that they would like to make the move to cloud computing. However, they need to ensure that there is no risk of their data being accessed by others. The company is willing to do what is required to ensure their data is secure and entirely owned by themselves.
- i. Which of the cloud deployment models would be the best choice for this organization? **(1 mark)**
 - ii. Give one advantage and one disadvantage of the recommended model **(2 marks)**
 - iii. The program Dropbox® is an application that is accessible to anyone over the Internet. This means that Dropbox® is an example of which cloud deployment type? **(1 mark)**

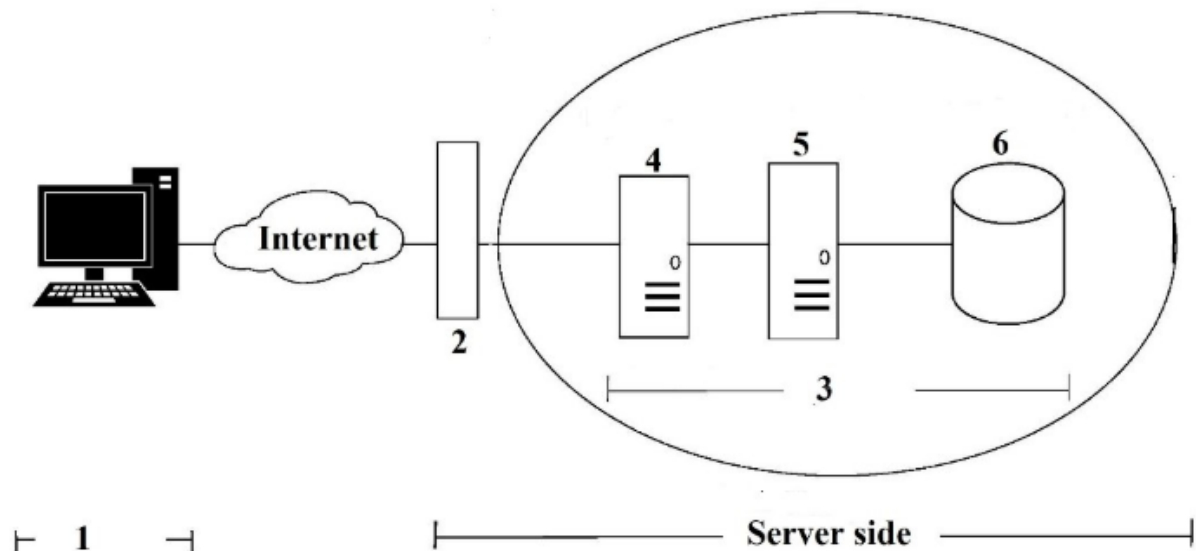
Question Seven**(10 Marks)**

- (A) Tiered web architecture, is a design approach for web applications that divides the system into multiple layers or tiers. Identify the three commonly used tiers **(3 marks)**
- (B) A multi-tier architecture is an expansion of the three-tier architecture in several different ways. Give two of these ways. **(2 marks)**
- (C) Differentiate between Client side and Server side Scripting. **(2 marks)**
- (D) Give two applications or use cases of Client side scripting. **(2 marks)**
- (E) Give one example of a Client side scripting language. **(1 mark)**

Question Eight

(15 Marks)

- (A) Name the elements of an E-commerce model **(6 marks)**
- (B) Give the names of the numbered components in the web-based e-commerce Tier diagram below **(6 marks)**



- (C) What is the function of a Network Firewall. **(1 mark)**
- (D) Packet Filtering Firewalls are normally deployed on the Routers which connect the Intranet to the Internet. Packet filtering firewall permits or denies network packets based on specifications. Give (2) specifications filtering is based on. **(2 marks)**

Question Nine

(10 Marks)

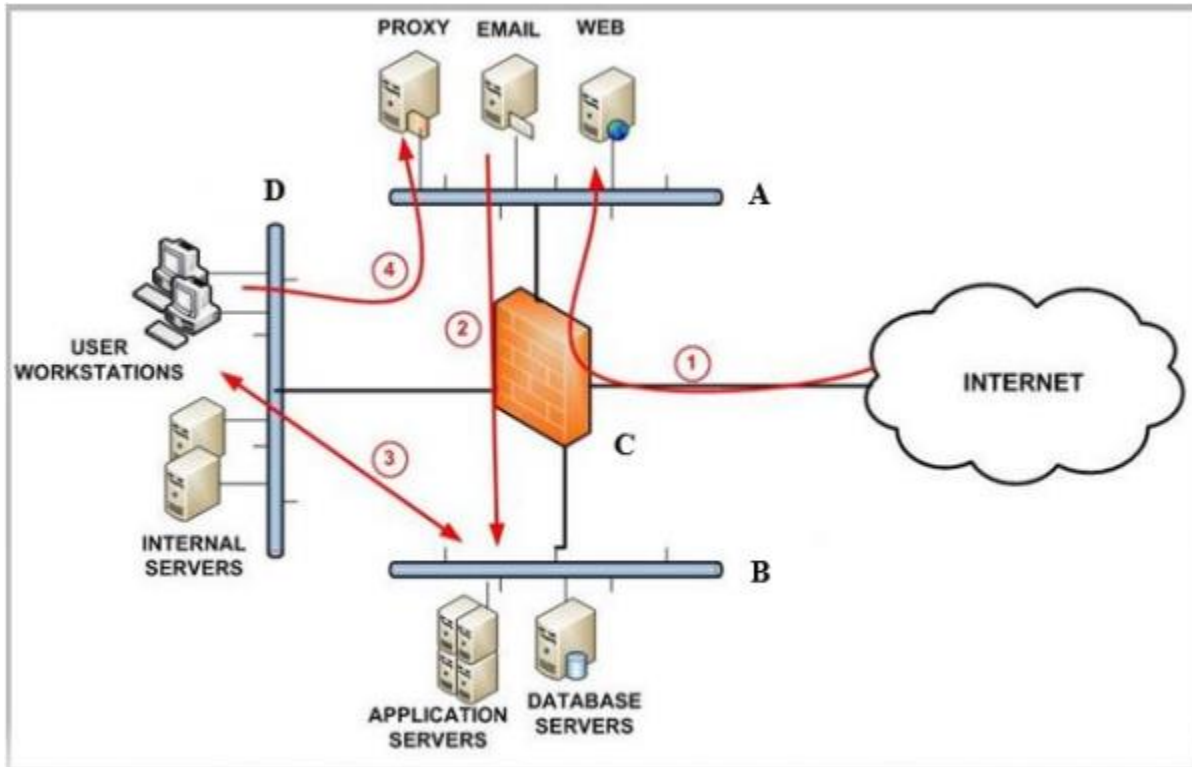
- (A) The “Access control” information security services provided over a network or internetwork includes these essential services: Authentication, Authorisation and Accountability. Briefly explain each term. **(3 marks)**
- (B) In reference to digital security, what is non-repudiation. **(1 mark)**
- (C) Using the Transpose encryption technique, with key 5, decipher the following message [nfekueot-rerwsid-oet-nrcy] Show ALL working. **(5 marks)**
- (D) State the characteristic of Symmetric Key Cryptography **(1 mark)**

Question Ten

(14 Marks)

(A) What is a DMZ in networking, and what is its purpose? **(3 marks)**

(B) Most businesses have a well-defined network structure that includes a secure internal network zone and an external untrusted network zone. In the Diagram below, based on the flows numbered **1,2,3 and 4**, indicate the names of the zones and components labelled **A, B, C and D** **(4 marks)**



A and B - DMZ Zones 1 and 2. C- Firewall and D - Internal Zone or Intranet.(4 marks)

(C) Explain the following types of Internet attacks: **(3 marks)**

- i. Phishing
- ii. Pharming
- iii. DoS or DDos

(TOTAL 121 MARKS)

END OF EXAMINATION!!