

**SPECIFY TYPE OF
EXAMINATION**

FIRST ATTEMPT

FIRST RESIT

SECOND RESIT

RE-TAKE



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS
UNIVERSITY EXAMINATION FOR THE DEGREE OF COMPUTER SECURITY AND
FORENSICS
2nd YEAR 2ND SEMESTER 2021/2022 ACADEMIC YEAR
MAIN CAMPUS**

COURSE CODE: ICB 1205

COURSE TITLE: TCP/IP Network Administration.

DATE:

TIME:

TIME:

Instructions:

- 1. Answer ALL questions in Section A and B and ANY other TWO questions in Section C**
- 2. Tick the most correct alternative in Section A**
- 3. Answers to Questions in Section B and C must be written in the spaces provided on the question paper.**
- 4. Candidates must ensure they submit their work by clicking “finish and submit attempt” button at the end.**



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SECTION A: 30 Marks (Each question carries 1 mark)

1. Which of the following pairs of well-known ports are the default values you would use to configure a POP3 email client?
 - A. 110 and 25
 - B. 143 and 25
 - C. 110 and 143
 - D. 80 and 110
 - E. 25 and 80

2. Which of the following protocols does the Ping utility use to exchange messages with another system?
 - A. UDP
 - B. TCP
 - C. ICMP
 - D. IGMP

3. Which of the following components does the port number in a transport layer protocol header identify?
 - A. A transport layer protocol
 - B. An application
 - C. A gateway
 - D. A proxy server

4. Which of the following organizations is responsible for assigning the well-known port numbers used in transport layer protocol headers?
 - A. Institute for Electronic and Electrical Engineers (IEEE)
 - B. Internet Assigned Numbers Authority (IANA)
 - C. Internet Engineering Task Force (IETF)
 - D. International Organization for Standardization (ISO)

5. The secured version of the Hypertext Transfer Protocol (HTTPS) uses a different well-known port from the unsecured version. Which of the following ports is used by HTTPS by default?
 - A. 25
 - B. 80
 - C. 110
 - D. 443

6. Which of the following Transmission Control Protocol (TCP) control bits is set to 1 to initiate the termination of a session?
 - A. SYN
 - B. URG
 - C. FIN
 - D. END
 - E. PSH



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7. What is the term for the combination of an IPv4 address and a port number, as in the following example: 192.168.1.3:23?
 - A. Socket
 - B. OUI
 - C. Well-known port
 - D. Network address
 - E. Domain

8. Which of the following is the primary application layer protocol used by web browsers to communicate with web servers?
 - A. HTTP
 - B. HTML
 - C. SMTP
 - D. FTP

9. Which of the following protocols appears on the network as a service that client computers use to resolve names into IP addresses?
 - A. DHCP
 - B. BOOTP
 - C. DNS
 - D. SNMP

10. Which of the following protocols use(s) the term *datagram* to describe the data transfer unit it creates? (Choose all correct answers.)
 - A. Ethernet
 - B. IP
 - C. TCP
 - D. UDP

11. Which of the following terms describes the Transmission Control Protocol (TCP) exchange that establishes a connection prior to the transmission of any data?
 - A. Synchronization
 - B. Initialization exchange
 - C. Connection establishment
 - D. Three-way handshake

12. Which of the following port values are used by the File Transfer Protocol (FTP)? (Choose all correct answers.)
 - A. 21
 - B. 23
 - C. 20
 - D. 53
 - E. 69

13. Which of the following protocols provides connectionless delivery service at the transport layer of the Open Systems Interconnection (OSI) model?



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- A. TCP
 - B. HTTP
 - C. UDP
 - D. ARP
14. What is the valid range of numbers for the well-known Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) ports used by servers?
- A. 1024 through 49151
 - B. 1 through 49151
 - C. 49152 through 65534
 - D. 1 through 1023
15. Ralph is a network administrator who has just installed a new open source email server for the users at his company. The server is configured to send and receive Internet email and create a mailbox for each user that will permanently store the user's mail on the server. Ralph next uses a protocol analyzer to examine the network traffic resulting from the new server installation. Which of the following new protocols should Ralph expect to see in his network traffic analysis? (Choose all correct answers.)
- A. SNMP
 - B. SMTP
 - C. POP3
 - D. IMAP
 - E. RIP
16. Which of the following protocols provides connection-oriented service with guaranteed delivery at the transport layer of the OSI model?
- A. TCP
 - B. HTTP
 - C. UDP
 - D. IP
17. Which of the following protocols is limited to use on the local subnet only?
- A. Address Resolution Protocol (ARP)
 - B. Dynamic Host Configuration Protocol (DHCP)
 - C. Domain Name System (DNS)
 - D. Simple Mail Transfer Protocol (SMTP)
18. At which of the following layers of the Open Systems Interconnection (OSI) model do the protocols on a typical local area network use MAC addresses to identify other computers on the network?
- A. Physical
 - B. Data link
 - C. Network
 - D. Transport
19. Which of the following organizations developed the Open Systems Interconnection (OSI) model?



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- A. International Telecommunication Union (ITU-T)
 - B. Comité Consultatif International Télégraphique et Téléphonique (CCITT)
 - C. American National Standards Institute (ANSI)
 - D. Institute of Electrical and Electronics Engineers (IEEE)
 - E. International Organization for Standardization (ISO)
20. Which layer of the Open Systems Interconnection (OSI) model is responsible for the logical addressing of end systems and the routing of datagrams on a network?
- A. Physical
 - B. Data link
 - C. Network
 - D. Transport
21. Which of the following devices typically operates at the network layer of the Open Systems Interconnection (OSI) model?
- A. Proxy server
 - B. Hub
 - C. Network interface adapter
 - D. Router
22. Which layer of the Open Systems Interconnection (OSI) model is responsible for dialogue control between two communicating end systems?
- A. Physical
 - B. Data link
 - C. Network
 - D. Transport
 - E. Session
23. Some switches can perform functions associated with two layers of the Open Systems Interconnection (OSI) model. Which two of the following layers are often associated with network switching? (Choose all correct answers.)
- A. Physical
 - B. Data link
 - C. Network
 - D. Transport
24. Identify the layer of the Open Systems Interconnection (OSI) model that controls the addressing, transmission, and reception of Ethernet frames, and also identify the media access control method that Ethernet uses.
- A. Physical layer; Carrier Sense Multiple Access with Collision Detection (CSMA/CD)
 - B. Physical layer; Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)
 - C. Data link layer; CSMA/CD
 - D. Data link layer; CSMA/CA
25. Which of the following devices operates only at the physical layer of the Open Systems Interconnection (OSI) model?
- A. Hub



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- B. Bridge
- C. Switch
- D. Router

26. The protocols at which layer of the Open Systems Interconnection (OSI) model use port numbers to identify the applications that are the source and the destination of the data in the packets?
- A. Application
 - B. Presentation
 - C. Transport
 - D. Network
27. An Ethernet network interface adapter provides functions that span which two layers of the Open Systems Interconnection (OSI) model?
- A. Physical and data link
 - B. Data link and network
 - C. Network and transport
 - D. Transport and application
28. Which of the following could be a valid MAC address for a network interface adapter?
- A. 10.124.25.43
 - B. FF:FF:FF:FF:FF:FF
 - C. 00:1A:6B:31:9A:4E
 - D. 03:AE:16:3H:5B:11
 - E. fe80::89a5:9e4d:a9d0:9ed7
29. Which of the following protocols prevents network switching loops from occurring by shutting down redundant links until they are needed?
- A. RIP
 - B. STP
 - C. VLAN
 - D. NAT
30. Network address translation (NAT) operates at which layer of the Open Systems Interconnection (OSI) model?
- A. Data link
 - B. Network
 - C. Transport
 - D. Application



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SECTION B: 20 Marks

1. Explain how a bridge provides network segmentation and how a switch can be used to increase the network performance (4marks)
2. Define and describe the function of a MAC address (4marks)
3. Most Ethernet networks can support either half- or full-duplex communications explain what you understand by this statement (4marks)
4. Explain the role data link layer play in data communication process (4marks)
5. What is the responsibility of the network layer protocols (1mark).
6. The basic function of the transport layer is to provide mechanisms to transport data between network devices explain the three ways in which it does this (3marks)

SECTION C: 20 Marks (Choose any two)

QUESTION 1

1. Briefly state and explain the two layers associated with the *TLS* protocol (4marks)
2. Briefly explain the role played by the Session Initiation Protocol (SIP) and Real-Time Transport Protocol (RTP), how they are distinct and what are the parts that form the RTP (6marks)

QUESTION 2

1. Why are WAN generally slower than LAN's (4marks)
2. You have been asked to install a network to give the network users the greatest amount of fault tolerance. Which network topology would you choose and why? (4mark)
3. Explain the function of a router and gateway (2marks)

QUESTION 3

1. Contrast the Peer-to-Peer and Client/Server Network Models (10 marks)