

2022-2023

EXAMINATION

Examination Period 2

Module: CO1507

Module CRN: 41125

Exam Type: Via Blackboard

Module Title: Introduction to Networking

Module Leader: Jonathan Edwards

Examination Paper Structure

This examination paper is divided into **2** sections.

There are **33** questions in total.

There are no appendices.

The mark obtainable for a question or part of a question is shown in brackets alongside the question.

Students to be provided with:

Access to a computer with web browser.

Instructions to Students:

The time allowed to complete this examination paper is **1 hr and 30 mins**.

Answer **ALL** questions in Section A and **ALL** questions in Section B.

The use of dictionaries is not permitted in this examination.

Section A

Total: 75 marks

Short, multiple-choice questions with 2.5 marks awarded for every correct answer; ½ mark is deducted for each incorrect answer. There is no penalty for a question not answered. All questions have ONE correct answer unless otherwise stated within the question.

1. Convert the Decimal number 172 to Binary:

- a. 10101100
- b. 01011101
- c. 11001110
- d. 11000110

2. Convert the Binary number 11011010 to Decimal

- a. 116
- b. 218
- c. 192
- d. 104

3. Convert the Binary number 11011011 to Hex

- a. CB
- b. DB
- c. AB
- d. CC

4. Convert the Hex number DCB4 to Binary

- a. 1101 1100 1011 0100
- b. 1101 0010 1001 1011
- c. 1101 0101 1100 1101
- d. 1100 1100 1010 1010

5. The subnet mask 255.255.255.252 is represented by the CIDR notation:

- a. /24
- b. /8
- c. /26
- d. /30

6. What is the network address of the following IP address: 172.16.100.93 /16

- a. 172.16.10.0 / 16
- b. 172.16.0.0 /16
- c. 172.0.16.0 /16
- d. 172.0.0.0 /16

7. How many valid useable host addresses can 192.168.1.0 with a subnet mask of 255.255.255.0 address support?
- 256
 - 254
 - 128
 - 126
8. What is the Linux command to navigate to your own home directory from any location?
- cd ..
 - ~/cd home
 - cd /home/
 - cd ~
9. Which of the following protocols design for communication between your web browsers and web servers?
- POP3
 - ARP
 - HTTP
 - OSPF
10. What layer is responsible for routing messages through internetwork in the TCP/IP model?
- Internet
 - Transport
 - Network Access
 - Session
11. What unique address is embedded in an Ethernet NIC and used for communication on an Ethernet network?
- Host address
 - IP address
 - MAC address
 - Network address
12. A network device that can join 2 or more different networks together is?
- Switch
 - Hub
 - Router
 - Firewall
13. ARP works at which layer of the OSI model?
- Data-Link
 - Network
 - Physical
 - Transport

14. A wireless host needs to request an IP address. What protocol would be used to process the request?
- a. FTP
 - b. HTTP
 - c. DHCP
 - d. ICMP
15. If the default gateway is configured incorrectly on the host, what is the impact on communications?
- a. The host is unable to communicate on the local network.
 - b. The host can communicate with other hosts on the local network, but is unable to communicate with hosts on remote networks
 - c. The host can communicate with other hosts on remote networks, but is unable to communicate with hosts on the local network
 - d. There is no impact on communications
16. What network service resolves a domain name to the IP address of the destination server?
- a. DNS
 - b. DHCP
 - c. FTP
 - d. SNMP
17. In Linux the permissions string `-rwxr-xr--` means that group users will have what rights?
- a. Read, Write, and Execute
 - b. Read, and Execute
 - c. Read only
 - d. No access
18. What characteristic of a network enables it to quickly grow to support new users and applications without impacting the performance of the service being delivered to existing users?
- a. Reliability
 - b. Scalability
 - c. Quality of Service
 - d. Accessibility
19. In what situation would UDP be the preferred transport protocol over TCP?
- a. When applications need to guarantee that a packet arrives intact, in sequence, and unduplicated
 - b. When a faster delivery mechanism is not needed
 - c. When applications do not need to guarantee delivery of the data
 - d. When destination port numbers are dynamic

20. Which devices will not forward an IPv4 broadcast packet by default?
- a. Ethernet switch
 - b. Router
 - c. Windows PC
 - d. None of the above. All devices forward IPv4 broadcast packets by default.
21. Which command gives us information about the routing table in a cisco router?
- a. display ip route
 - b. display routing table
 - c. show ip route
 - d. show ip interface
22. Which command is used to change the link status of the interface from down to up?
- a. shutdown
 - b. no shutdown
 - c. linkup
 - d. linkdown
23. Which is a characteristic of static routes?
- a. They are manually configured.
 - b. They are advertised to directly connected neighbors.
 - c. They are appropriate when there are many redundant links.
 - d. They automatically adjust to a change in network topology.
24. Which of the following statements is true?
- a. Apple Mac OS is a Linux distribution
 - b. GNU / Linux only runs on ARM CPU architecture
 - c. Linux is a UNIX-like operating system
 - d. MS Windows is based upon GNU / Linux
25. Which utility uses the Internet Control Messaging Protocol (ICMP)?
- a. RIP
 - b. DNS
 - c. ping
 - d. NTP
26. Which Cisco IOS CLI mode allows users to access all device commands, such as those used for configuration, management, and troubleshooting?
- a. global configuration mode
 - b. privileged EXEC mode
 - c. user EXEC mode
 - d. interface configuration mode
27. What is the network address of the following IP address: 172.16.10.33 /18
- a. 172.16.0.0/16
 - b. 172.16.10.0/16
 - c. 172.16.0.0/18
 - d. 172.16.10.0/18

28. Which command in MS Windows is used to show the IP addresses for all local network interfaces?

- a. `ipconfig /all`
- b. `ip addr show`
- c. `ip -settings`
- d. `ip -show addr`

29. Which is a Linux command is used to show your network adaptors IP address configuration on the command line?

- a. `ipconfig /all`
- b. `ip addr`
- c. `ip -config`
- d. `netplan`

30. Which of the IPv6 pair represent the correct original and shorter address?

- a) Original: CB41:0000:140F:0000:0000:0000:CA5B:131B
Shorter: CB41:0000:140F::CA5B:131B
- b) Original: CC41:0000:140F:0000:0000:0000:CA5B:131B
Shorter: CC41:0:140F::CA5B:131B
- c) Original: 4BC8:0001:0002:0003:0004:0005:0006:0007
Shorter: 4BC8:01:02:03:04:05:06:07
- d) Original: D001:000A:000C:0003:0004:0005:0006:0007
Shorter: D1:A:C:3:4:5:6:7

Section B

31. Explain how subnetting can improve network performance and security.

(5 marks)

subnetting creates smaller broadcast domains which improves performance by reducing the amount of broadcast traffic between hosts. It also improves security by segmenting a larger network into smaller constituent parts with their own network address and broadcast domain.

32. Fill in the blank with the correct letter from the answer items.

(10 marks: 1 mark for each)

1. **GNU / Linux**
2. **Broadcasts**
3. **Bandwidth**
4. **MAC address**
5. **CLI stands for ..**
6. **The command "copy running-config startup-config" is used for ...**
7. **Peer-to-peer (P2P)**
8. **WAN**
9. **Switch**
10. **ARP**

B
D
C
E
A
H
G
J
F
I

Answer Items:

- A. Command Line Interface
- B. A Unix-like operating system made up of different OS components and services available as free and open-source software.
- C. The amount of data that can flow from one place to another in a given amount of time
- D. Traffic that is sent to all hosts within a local area network which are absolutely necessary for network operation, but which also an overhead slowing down overall network operation.
- E. A hardware identification number that uniquely identifies each device on a network, made up of six two-digit HEX numbers, separated by colons.
- F. Is a device which is used to connect multiple computers inside Local Area Network (LAN), operate at Layer Two (Data Link Layer) of the OSI model.
- G. Group of computers linked together with same permissions and responsibilities to process the data
- H. Copies the currently running configuration of Cisco device to the location specified by the CONFIG_FILE environment variable. This variable specifies the device and configuration file used for initialization.
- I. A protocol that broadcasts to discover the MAC address of a given IP address
- J. A routed network environment with multiple broadcast domains extending over a large area.

33. Fill in the blanks:

A local college has just finished a new building to house a Computer and Networks departments. The college needs to setup 4 networked teaching labs. Each lab is required to support between 40 - 50 computers and must be on a separate network. You have been given the following network address: 192.168.0.0./24 you need to use custom subnetting to provide a solution to the college's needs.

(10 marks: 1 mark for each)

Question	Answer
The new custom subnet mask chosen will be	255.255.255.192
The equivalent CIDR notation for this mask is	/26
The first subnet address (address for lab1) will be	192.168.0.0
The second subnet address (address for lab2) will be	192.168.0.64
The third subnet address (address for lab3) will be	192.168.0.128
The fourth subnet address (address for lab4) will be	192.168.0.192
The last host address (available address) in the second subnet will be	192.168.0.126
The broadcast address of the first subnet will be	192.168.0.63
The last host address (available address) in the third subnet will be	192.168.0.190
The number of available hosts in each subnet will be	2^6-2 (or 62)

End of Exam Questions.