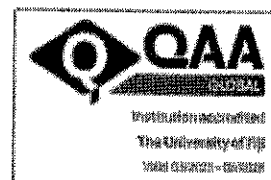


The University of Fiji
(An Entity of Arya Pratinidhi Sabha of Fiji)



SCHOOL OF SCIENCE AND TECHNOLOGY
Semester 1, 2026

FINAL EXAMINATION PAPER

ITC362: SYSTEM AND NETWORK ADMINISTRATION

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with a pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. This paper contains Three (3) sections A, B and C. All questions are compulsory to answer.
6. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
7. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-10	Multiple Choice	10	18 minutes
B	1 - 35	Short/Long Answer Questions	70	126 minutes
C	1 – 4	Practical/Application Questions	20	36 minutes
		TOTAL	100	180 Minutes

Write the question number and the letter which represents the most appropriate answer for each question in the answer booklet. Each question is worth 1 mark.

1. A hub differs from a switch because a hub:
 - A. Uses MAC addresses to forward frames
 - B. Broadcasts incoming signals to all connected ports
 - C. Separates collision domains
 - D. Maintains a switching table
2. Which TCP/IP layer is responsible for reliable end-to-end delivery?
 - A. Application
 - B. Internet
 - C. Transport
 - D. Network Access
3. What is the binary equivalent of the subnet mask 255.255.255.0?
 - A. 11111111.11111111.11111111.00000000
 - B. 11111111.11111111.00000000.00000000
 - C. 11111111.00000000.11111111.00000000
 - D. 00000000.00000000.11111111.11111111
4. Which class of IPv4 address provides approximately 254 usable hosts per network by default?
 - A. Class A
 - B. Class B
 - C. Class C
 - D. Class D
5. Which NAT variant allows many private IPs to share one public IP using port numbers?
 - A. Static NAT
 - B. Dynamic NAT
 - C. CIDR
 - D. PAT
6. Which wireless security protocol is considered strongest among these?
 - A. WEP
 - B. WPA
 - C. WPA2
 - D. Open Authentication
7. Which command is most commonly used to test connectivity between two hosts?
 - A. TRACERT
 - B. NSLOOKUP
 - C. PING
 - D. IPCONFIG

8. Which port does HTTPS use by default?
- A. 20
 - B. 21
 - C. 80
 - D. 443
9. Which protocol is responsible for translating domain names such as google.com into IP addresses?
- A. FTP
 - B. DNS
 - C. DHCP
 - D. SNMP
10. Which type of cable is least susceptible to electronic eavesdropping?
- A. Coaxial
 - B. UTP
 - C. STP
 - D. Fiber-optic

SECTION B. SHORT/LONG ANSWER QUESTIONS 70 MARKS

Clearly explain and discuss ALL the questions from this section and write the answers in the answer booklet provided. Avoid using point form while writing answers.

1. Differentiate between a hub and a switch in terms of how they transmit data. (2 Marks)
2. Explain the difference between physical topology and logical topology in networking. (2 Marks)
3. Explain the purpose of DHCP and how it simplifies network administration. (2 Marks)
4. Define subnetting and explain one benefit of dividing networks into subnets. (2 Marks)
5. What is a collision domain, and how do switches reduce collisions? (2 Marks)
6. Explain the function of VLANs in modern networks. (2 Marks)
7. What is auto-negotiation on a switch port, and why is it useful? (2 Marks)
8. Define DoS (Denial of Service) attack and explain its impact on a network. (2 Marks)
9. Explain the purpose of Active Directory in a Windows domain environment. (2 Marks)
10. Explain why subnet masks are necessary in IPv4 addressing. (2 Marks)
11. Explain the difference between a MAC address and an IP address. (2 Marks)
12. What is the difference between simplex, half-duplex, and full-duplex communication? (2 Marks)
13. What is a broadcast domain, and which device is used to separate broadcast domains? (2 Marks)
14. What is authorization, and how does it differ from authentication? (2 Marks)
15. Explain the difference between private IP addresses and public IP addresses. (2 Marks)
16. Explain the difference between POP3 and IMAP for email retrieval. (2 Marks)

17. Explain the difference between single-mode fiber and multimode fiber. (2 Marks)
18. What is a multilayer switch, and how does it differ from a Layer 2 switch? (2 Marks)
19. What is the difference between NAT and PAT? (2 Marks)
20. A computer receives the IP address 169.254.12.25. What does this indicate about the network connection? (2 Marks)
21. What is a network protocol, and why is it essential for communication between devices? (2 Marks)
22. Explain the DHCP DORA process (Discover, Offer, Request, Acknowledge). (2 Marks)
23. Define bandwidth, data throughput, and latency in networking. (2 Marks)
24. A company network designed using a star topology suddenly stops working for all devices, even though cables and computers are functioning properly. What is the most likely cause of the failure? (2 Marks)
25. What is a Virtual Local Area Network (VLAN), and how does it improve network organization, security, and traffic management? (2 Marks)
26. What is the TCP three-way handshake? Explain each step involved in establishing a reliable connection between a client and a server. (2 Marks)
27. A wireless network operates at 54 Mbps, but users experience much lower speeds when many devices connect simultaneously. Explain the technical reasons behind this bandwidth reduction. (2 Marks)
28. A legacy network using a bus topology frequently goes down whenever a new device is added. Why does this happen and what modern alternative should be recommended? (2 Marks)
29. Explain the difference between a protocol suite and a single protocol. (2 Marks)
30. What is supernetting, and how does it combine multiple smaller networks into a larger network to improve routing efficiency? (2 Marks)
31. What is an uplink port, and when is it used? (2 Marks)
32. Explain the difference between network ID and host ID, (2 Marks)
33. Why is physical security often considered the first layer of network security? (2 Marks)
34. What happens when duplicate MAC addresses appear on a network? (2 Marks)
35. Why is centralized management important in enterprise networking? (2 Marks)

Answer ALL the questions from this section in the answer booklet provided.

1. Explain the OSI Model and describe the functions of each of its seven layers. (5 Marks)
2. You are required to create a LAN environment. The Environment should include: 2 x Endpoint Desktop (2 per subnetwork), 2 x Switch (2960-24TT) (1 per subnetwork), 1 Router (1941 Router) connecting both the subnetwork.

A. Draw a Network Diagram illustrating the above environment. Label all components correctly, and rename all the devices. (5 Marks)

B. Write the Command to Configure the Router. (Configure interface g0/0). (3 Marks)

Router>	
Router#	
Router(config)#	
Router(config-if)#	
Router(config-if)#	

C. Configure the network details on Endpoint (Desktop). (Configure one Desktop) (2 Marks)

IPv4 Address	
Subnet Mask	
Default Gateway	
DNS Server	

3. Given the IP address 192.168.1.20 with a subnet mask of 255.255.0.0, determine the following:
 - A. What is the Network ID? (0.5 Mark)
 - B. What is the Host ID? (0.5 Mark)
 - C. How many usable hosts are possible in this network? Show all Calculation. (0.5 Mark)
4. Given the IP address 192.168.10.75/24, answer the following: Show all Calculation.
 - A. What is the Network ID? (0.5 Mark)
 - B. What is the subnet mask in dotted decimal notation? (0.5 Mark)
 - C. How many usable hosts are available in this network? (0.5 Mark)
 - D. If 2 bits are borrowed for subnetting, what is the new prefix length? (0.5 Mark)
 - E. How many subnets will be created? (0.5 Mark)
 - F. How many usable hosts will each subnet support? (1 Mark)

THE END