



THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY  
DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

**FIRST SEMESTER EXAMINATIONS – 2023**

**FOURTH YEAR BACHELOR IN COMPUTER SCIENCE**

**CS413 –NETWORKING III**

**TIME ALLOWED: 3 HOURS**

**INFORMATION FOR CANDIDATES**

1. Write your name and student number clearly on the front of the examination answer booklet.
2. You have 10 minutes to read this paper. You must not begin writing during this time.
3. This paper contains FIVE (5) questions. You are to **answer ALL** the questions.
4. All answers must be written in examination answer booklets provided. No other written materials will be accepted.
5. Start the answer for each question on a **new** page. Do **not** use red ink.
6. Notes, textbooks, mobile phones and other recording devices are not allowed in the examination room.
7. Scientific and business calculators are allowed in the examination room.
8. A formula sheet and a normal distribution graph are attached.

**MARKING SCHEME**

Marks are indicated at the beginning of each question. The total is **100 marks**.

**QUESTION 1 [2 marks each = 20 marks]**

- (a) Discuss a basic difference between static and dynamic routing.
- (b) What is the common difference between a distance vector routing protocol and a link state routing protocol?
- (c) Create a Telnet link for remote access to a router on an IPv4 network. The password for the telnet session is “Remote Link” without the quotes. Assume the router is in global configuration mode.
- (d) Write the command to ensure the Privileged Exec mode is password protected on a router. The password to be configured on this router is “pass@2020” without the quotes. You can use either plaintext or the encrypted mode.
- (e) Which command on the router encrypts all passwords configured in plain text? Write the command.
- (f) How would you describe the difference between a unique local address and global unicast address in IPv6?
- (g) What is the purpose of the link local address in IPv6?
- (h) Which type of static route is configured with a greater administrative distance to provide a backup route to a route learned from a dynamic routing protocol?
- (i) Compared with dynamic routes, what are two advantages of using static routes on a router?
- (j) What VLANs are allowed across a trunk when the range of allowed VLANs is set to the default value?

**QUESTION 2 [3 marks each = 15 marks]**

- (a) Give the details about ping command in Cisco IOS and how it works.
- (b) What is the traceroute command in Cisco IOS?
- (c) What is the show interface command in Cisco IOS and show how is it used?
- (d) Explain the show ip route command in Cisco IOS and show how is it used?
- (e) Describe the debug command in Cisco IOS and show how is it used?

**QUESTION 3 [5 marks each = 20 marks]**

- (a) Explain what IPv4 addressing scheme, including classes in details.
- (b) Give the details about router configuration using the Cisco IOS.
- (c) Explain what OSPFv2 and OSPFv3 configuration are, and their uses.
- (d) What are some of the characteristics of a typical VLAN arrangement?

**QUESTION 4 [4 marks each = 20 marks]**

- (a) How do you configure basic routing protocols using Routing Information Protocol version 2 (RIPv2 for IPv4) and RIPv3 for IPv6?
- (b) What are the Types of access control lists and write the Benefits of using an ACL.
- (c) Define routing? What is the minimum information that a router should know for routing?
- (d) Write a short note about NAT. While configuring NAT on Router, which command would you place on interface connected to the Internet?
- (e) Explain what Overloading or Port Address Translation (PAT) is.

**QUESTION 5 [6 + 6 + 6 + 10 marks = 28 marks]**

- (a) What are basic steps you can take to troubleshoot WAN network issues and how can you prevent WAN network issues from occurring?
- (b) How do you configure a basic wireless LAN using a wireless router and access point? What are some important security considerations when configuring a wireless LAN?
- (c) What is the function of virtual LAN (VLAN)? What are the different types of virtual LAN (VLAN)? Write the name with details.
- (d) Describe the following commands related to basic router configuration with example.
  - i. Show ip route
  - ii. Hostname
  - iii. Password
  - iv. Login
  - v. Description

**END OF EXAM**