



PANIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS
DEPARTMENT OF SOFTWARE ENGINEERING

QUALIFICATION: BACHELOR OF COMPUTER SCIENCE HONOURS (SOFTWARE DEVELOPMENT)	
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DURATION: 2 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL the questions.2. Read all the questions carefully before answering.3. Number the answers clearly.

THIS QUESTION PAPER CONSISTS OF 5 PAGES
(Including this front page)

SECTION A: TRUE OR FALSE

This section consist of 20 questions. Answer all the questions

Each correct answer is allocated 2 Marks

Write True or False for Questions 1 to 20.

1. One of the software used to monitor the status of any network packet sent is Wireshark. [2 Marks]
2. Plagiarism statement must be on top of a VPL Python program on elearning. [2 Marks]
3. Malware stands for Multipurpose software. [2 Marks]
4. In order to ensure the security of the data/ information, we need to Decrypt the data. [2 Marks]
5. TCP/IP stands for Transmission Control Protocol/ internet prototype. [2 Marks]
6. Hackers usually use the computer virus to send good will messages to users. [2 Marks]
7. To protect the computer system against the hacker and different kind of viruses, one must always keep firewall on in the computer system. [2Marks]
8. A software program or a hardware device that filters all data packets coming through the internet, a network, etc, is known as Cookies. [2 Marks]
9. Worm is considered as an unsolicited commercial email. [2 Marks]
10. One way to prevent password attack is use of surname as password. [2 Marks]
11. A ransomware attacks may be similar to kidnapers kidnap data for money. [2 Marks]
12. Insider attacks involve someone outside the organization carrying out an attack. [2 Marks]
13. Denial of Service (DoS) and Distributed DoS are the same. [2 Marks]
14. Passive attacks and Active attacks are types of attacks. [2 Marks]
15. Since cyber attackers are now using Artificial Intelligence (AI) tools to carryout attacks, it is essential for organisations to Upgrade their protection mechanism from conventional defense to AI-based defense mechanism. [2 Marks]
16. Additional functionalities to cater for the shortcomings of IPV4, includes, security, authentication and integrity. [2 Marks]
17. The IP Address: 210.125.15.100 is a Class A. [2 Marks]
18. SQL injection involves adding malicious code to a database query to gain unauthorized access to a web application's database. [2 Marks]
19. Command injection is a database injection technique that exploits a security flaw. [2 Marks]
20. The netid of the IP Address: 128.98.89.129 is 128.98.0.0 [2 Marks]

SECTION B: NETWORK PACKETS

Explain each of the following *send* statement and the possible output, when is executed on Scapy environment. For instance, the statement `send(IP(dst='127.0.0.1'))` creates a network packet with destination IP address 127.0.0.1. When executed on Scapy, the output will be:
Sent 1 packets

21. `send(IP(dst='127.0.0.1'), return_packets=True)` [2 Marks]
22. `send(IP(src='128.99.4.123', dst='127.110.120.100'))` [2 Marks]
23. `send(IP(ttl=64, src='128.99.4.123', dst='127.110.120.100'))` [2 Marks]
24. `send(IP(ttl=64, src='128.99.4.123', dst='127.110.120.100'), count=3)` [2 Marks]
25. `send(IP(ttl=64, src='128.99.4.123', dst='127.110.120.100')/TCP()/"Welcome Class")` [2 Marks]
26. `send(IP(ttl=64, src='128.99.4.123', dst = '127.110.120.100')/TCP(sport=135,dport=136)/"Welcome to Python Lecture", count=3)` [2 Marks]

SECTION C: CODE SNIPPET

This section consists of 3 questions. Answer **ALL** the questions

Each correct answer is allocated 8 Marks

Question One

[8 Marks]

(A) The Python program below get input data from the keyboard and compare with username and password within the program. Modify the program to compare

username and password from a dataset named: Password-Id.csv

(4 Marks)

```
attempts=0
remains=5
print('PASSWORD ENTERING MENU FOR ABC BANK, MAXIMUM ATTEMPT IS 5')
while attempts < 5:
    username = input('Enter your username: ')
    password = input('Enter your password: ')
    if username == 'admin' and password == 'admin123':
        print('You have successfully logged in')
        break
    else:
        print('Incorrect username and/or password, you may retry again')
        remains -= 1
        print('Number of Attempts left:', remains)
        attempts += 1
    if attempts == 5:
        print('Account locked')
        break
    continue
```

(B) Find the Class, netids and hostids for the following IP addresses:

(4 Marks)

130. 90. 80. 108

200.10.117.106

80.125.15.100

Question Two

[8 Marks]

(A) If a user continues to enter a wrong password in the Python code segment below, how many times will the print statement print.

```
attempts = 1
while attempts < 7:
    username = input('Enter your username: ')
    password = input('Enter your password: ')
    if username == 'admin' and password == 'admin123':
        print('You have successfully logged in.')
        break
    else:
        print('Incorrect credentials. Check if you have Caps lock on and try again.')
        attempts += 1
    continue
```

- (B) Write a Python program to check if a number is a spy number or not using the for loop. For example, if the sum of digits equals the product of individual digits in a number, it is a spy. In this Python spy number example, we used a while loop to divide the number into digits and find the sum and the product of the digits. The if statement checks whether the sum equals product, if true, spy number.

Sample output1:

Enter a number to check for spy number: 123
123 is a spy number

Sample output2:

Enter a number to check for spy number: 1124
1124 is a spy number

Sample output3:

Enter a number to check for spy number: 22
22 is a spy number

Sample output4:

Enter a number to check for spy number: 33
22 is a spy number

Sample output5:

Enter a number to check for spy number: 1441
1441 is Not a spy number

Question Three

[8 Marks]

- (A) Write a Python program segment to check the IP address of a web site: ium.edu.na **(4 Marks)**
- (B) Discuss six differences between IPV4 and IPV6. **(4 Marks)**

SECTION D: CODES/THEORY

Answer **all** questions

Each correct answer is allocated 8 Marks

Question One

[8 Marks]

- (A) Write short note on the following: **(4 Marks)**
-Password attack and how to avoid it.
-Command Injection attack
- (B) Explain the security risk with the codes below and rewrite the codes to avoid attack.

```
import os
```

(4 Marks)

```
Num1=input("Enter an integer Arithmetic Expression : ")  
print ("Result =", eval(Num1))
```

Question Two**[8 Marks]**

Modify the Python program segment below to avoid command injection.

```
import os
Num1=input("Enter an integer Arithmetic Expression : ")
print ("Result =", eval(Num1))
```

Question Three**[8 Marks]**

(A) The Python program below extracts the first 3 characters in an IPV4 IP Address and display them by appending the first octet to the previous.

IP = ["198.454.234.023", "177.232.187.001", "298.367.823.201", "323.419.312.222"] **(4 Marks)**

```
#Extract the first 3 characters
networks=[]
for address in IP:
networks.append(address[0:3])
print(networks)
```

Sample output:

```
['198']
['198', '177']
['198', '177', '298']
['198', '177', '298', '323']
```

Modify the above program to extract the first 4 characters in IPV6 Address below:
8194:1753:8162:1004:0500:2220:17753:8162
6193.4444.1285.5731.2399.0200.1200.6525
7193.3232.1285.5731.7199.3330.4440.1225

and display them by appending the first octet to the previous.

(B) Briefly discuss the following types of network topology – Bus, Star and Hybrid **(4 Marks)**

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