



UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE : BNS 3123

COURSE : WIRELESS NETWORK

SEMESTER/SESSION : 2-2024/2025

DURATION : 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer ALL questions.
3. All answers should be written in answer booklet.
4. Write legibly and draw sketches wherever required.
5. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 4 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

- a) Identify the correct wireless network terminology for the following: (5 marks)
- A WWAN technology used by cell phones and other handheld devices.
 - Another name for an ad hoc network.
 - A wireless network for interconnecting devices centered around an individual person's workspace.
 - A card that is inserted into a device to connect it to a wireless network.
 - A station as a network device that transmits and receives data and connects wireless users to the wired network.
- b) State and illustrate **TWO (2)** service set under infrastructure topology model. (5 marks)
- c) Indicate **target benefit of wireless network** challenges and justify your answer in Table 1. (10 marks)

Table 1

Benefit	Wired or Wireless	Justification
Interference		
Installation		
Security		
Mobility		
Health risks		

QUESTION 2

- a) Define purpose of 802.11 standard and state OSI layer does it operate. (4 marks)
- b) List **SIX (6)** 802.11 common family standard for WLAN. (6 marks)
- c) Describe **TWO (2)** major improvement from 802.11g to 802.11n. (4 marks)
- d) Explain role of 802.11i in wireless security. (2 marks)
- e) Differentiate between active scanning and passive scanning from wireless client device. (4 marks)

QUESTION 3

- a) Describe role of a radio frequency (RF) spectrum in wireless communication. (2 marks)
- b) Define purpose of radio frequency modulation and state **THREE (3)** types of digital modulation (4 marks)
- c) Based on the 10's and 3's rules in Table 2, determine the following power value in milliwatt(mW). (6 marks)

Table 2

Rule	% of power loss/gained	Current Power level
-3 dB	50% lost	Loss half of power
+3 dB	100% gained	Gain double the original power
-10 dB	90% lost	Loss one-tenth of original power
+10 dB	100% gained	Gain ten times the original power

- i. $16 \text{ mW} + 6 \text{ dB}$
- ii. $10 \text{ mW} + 10 \text{ dB}$
- iii. $60 \text{ mW} - 3 \text{ dB}$
- d) State **FOUR (4)** impairments occurred in wireless transmission. (4 marks)
- e) Define amplitude and frequency based on Figure 1. (2 marks)

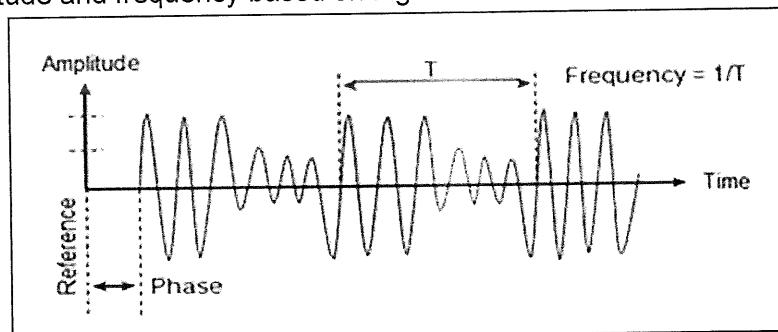


Figure 1

- f) Justify the purpose of signal-to-noise ratio (SNR) in wireless communication. (2 marks)

QUESTION 4

- a) State **THREE (3)** primary security framework to be applied on network device as access control. (3 marks)
- b) List **TWO (2)** examples of wireless attacks against enterprise organization (2 marks)
- c) List **TWO (2)** examples of wireless attacks against mobile users (2 marks)
- d) List **TWO (2)** categories WLAN protection and provide an example for each. (4 marks)
- e) Describe the difference between WEP and WPA/WPA2 security protocols. (3 marks)
- f) Justify **THREE (3)** impact of rogue access point detection in wireless network. (6 marks)

QUESTION 5

- a) Define purpose on the following wireless component: (6 marks)
- Power Over Ethernet (POE)
 - Multiple-Input Multiple Output (MIMO)
 - Wireless Network Adapters
- b) Differentiate omnidirectional and directional antenna and give an example component that installed for each antenna. (4 marks)
- c) List **FOUR (4)** well-known wireless organization and certification. (4 marks)
- d) Explain the following emerging technologies (6 marks)
- Embedded Subscriber Identity Module (eSIM)
 - 5G network
 - Wi-Fi 6

-----End of question-----