



PAN AFRICA CHRISTIAN UNIVERSITY

(BACHELOR OF BUSINESS INFORMATION TECHNOLOGY)

END OF SEMESTER EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: BIT 205

CAMPUS: ROYSAMBU

COURSE TITLE: DATA COMMUNICATION

EXAM DATE: THURSDAY, 6TH DECEMBER 2018

TIME: START HOUR – END 14:00-17:00 HRS

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Four questions in Section **B**.
- Write only your **student number** on the answer booklet provided.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

Question 1:

- I. Define the following terms as used in Data Communications
 - i. Data- (2 Marks)
 - ii. Signal- (2 Marks)
 - iii. Transmission Media- (2 Marks)
 - iv. Terminal (2 Marks)
 - v. Host (2 Marks)
- II. Clearly explain why data communication protocols are important in a Data Communications infrastructure and list any three basic functions of the same. (5 Marks)
- III. Explain the relationship between Data Communications and Telecommunication (2 Marks)
- IV. Distinguish between Physical and Logical topology, giving an example in each case, (4 Marks)
- V. Describe the OSI Reference Model and identify any three of its uses (5 Marks)
- VI. Explain the following protocols indicating their relevance in the Data transmission process: (6 Marks)
 - i. TCP-
 - ii. UDP-
 - iii. IP-
- VII. Explain with the aid of a diagram, the following data transmission techniques:
 - i. Serial data transmission (2 Marks)
 - ii. Parallel data transmission (2 Marks)
- VIII. Distinguish between Synchronous and Asynchronous Transmission modes. (4 Marks)

SECTION B

(Answer any FOUR (4) questions in this section)

Question 2:

- I. Explain the concept of signaling and distinguish between In-channel and Common-Channel Signaling.
(4 Marks)
- II. Identify the third layer (Layer 3) of the OSI reference model, clearly explaining what happens at the layer and giving an example of a device that operates at the layer. (4 Marks)
- III. Describe transmission impairment, clearly explaining any two causes of transmission impairment. (5 Marks)
- IV. Explain unguided transmission media and give an example of the same (3 Marks)

Question 3:

- I. Distinguish between Single-mode and Multi-mode fibre optic cable identifying one connector type associated with each type. (4 Marks)
- II. Identify any two factors that determine data rate and distance on a media type. (2 Marks)
- III. Describe the Twisted Pair Cable (physical and transmission characteristics) and identify the appropriate connector. (2 Marks)
- IV. The TCP is said to be a connection-oriented protocol.
 - i. Explain the above statement (2 Marks)
 - ii. List any other FIVE protocols that are connection-oriented (5 Marks)

Question 4:

- I. Explain **multiplexing** and its rationale in data transmission. (3 Marks)

- II. Distinguish between Time Division Multiplexing and Frequency Division Multiplexing. (4 Marks)
- III. Explain the term Switching as used in Wide Area Networking. (2 Marks)
- IV. Distinguish between Packet Switching, Circuit Switching and Message Switching. (6 Marks)

Question 5:

- I. Explain how CSMA/CD works and how it differs from CSMA/CA. (6 Marks)
- II. Amina intends to set up a network. She has 20 computers located in her two offices. Between the *Ring* and the *Star* physical topologies, advise her on which one to use and give three reasons for your answer (5 Marks)
- III. Explain any two LAN logical topologies (4 Marks)

Question 6:

- I. Differentiate Analog and Digital data representation. Use diagrams to aid in the explanation. (6 Marks)
- II. Clearly explain the functionality of a switch and give reasons why a switch is more preferable than a hub. (5 Marks)
- III. Explain the 5-4-3 repeater rule. (4 Marks)

Question 7:

- I. Any WAN connection type uses a WAN encapsulation protocol (WAN technology) to encapsulate traffic while it crosses the WAN link. Explain the following technologies. (4 Marks)
 - i. Dial-up
 - ii. Frame Relay
- II. Explain Roaming as used wireless LANs. (2 Marks)
- III. Briefly explain the following approaches to Spread Spectrum. (4 Marks)
 - i. Frequency Hopping Spread Spectrum (FHSS)
 - ii. Direct Sequence Spread Spectrum (DSSS)
- IV. Data Encoding deals with how best to transmit data (0s and 1s) across various media. Given the following set of bits: **1001**. Elaborate how they can be transmitted using both even and odd parity checking. (4 Marks)

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EXAMINATIONS PAPER**



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