



UNIVERSITI KUALA LUMPUR
Malaysia France Institute

FINAL EXAMINATION
JANUARY 2014 SESSION

SUBJECT CODE : FCB 31402
SUBJECT TITLE : NETWORK AND MANAGEMENT SYSTEMS
LEVEL : BACHELOR
TIME / DURATION :
(2.5 HOURS)
DATE :

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper **CAREFULLY**.
2. This question paper is printed on both sides of the paper.
3. Please write your answers on the answer booklet provided.
4. Answer should be written in blue or black ink except for sketching, graphic and illustration.
5. Answer all questions
6. Answer all questions in English.

THERE ARE 4 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

INSTRUCTION: Answer ALL questions.

Please use the answer booklet provided.

Question 1

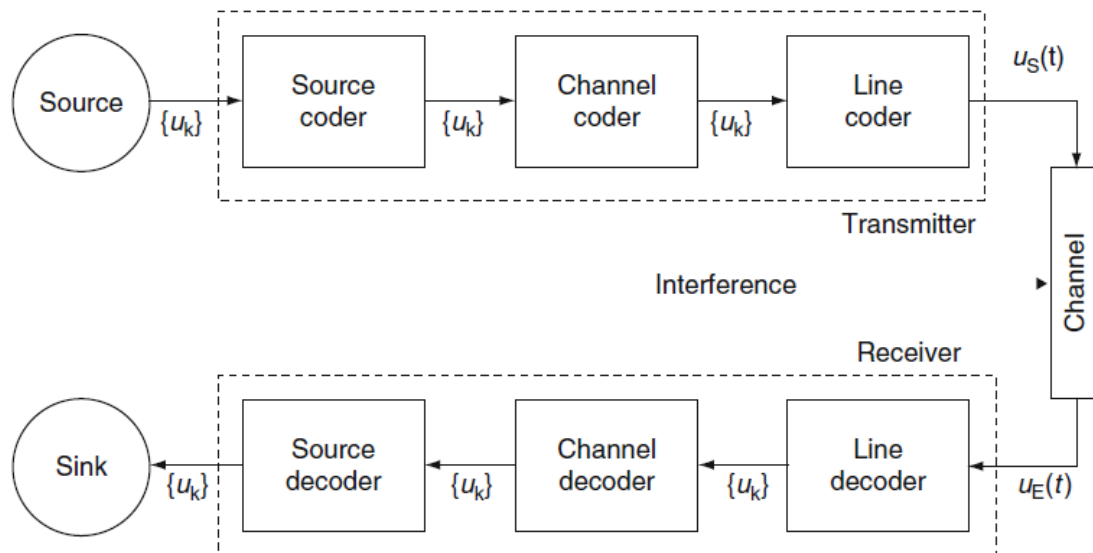


Figure Q1

The figure Q1 above shows the process of digital data transmission systems.

(a) Based on the figure above, briefly explain how data bits are transferred from source to sink.

(6 marks)

(b) Explain the functionalities of **source coding and decoding** in digital data transmission systems.

(5 marks)

(c) Cyclic Redundancy Check (CRC) is an error detection technique often used in field buses. Describe the mechanism for error detection using Cyclic Redundancy Check (CRC).

(4 marks)

Question 2

- (a) Describe the importance of '**interoperability**' in building systems.
(2 marks)
- (b) List the advantages of network-based systems in building environment.
(2 marks)
- (c) Distinguish the difference between Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP).
(4 marks)
- (d) List 7(SEVEN) types of transmission methods.
(7 marks)

Question 3

- (a) Ring topology often associated with Token Ring and Fiber Distributed Data Interface (FDDI) networks. Describe, with the aid of diagrams, the operation of a ring topology network.
(3 marks)
- (b) Networks are important for building automation systems. There are two widely deployed configuration; centralized and decentralized networks. Explain the differences between centralized and decentralized networks.
(4 marks)
- (c) Attached Resource Computer Network (ARCNET) is one of the LAN standard used in building automation systems. Describe the characteristics of ARCNET.
(3 marks)

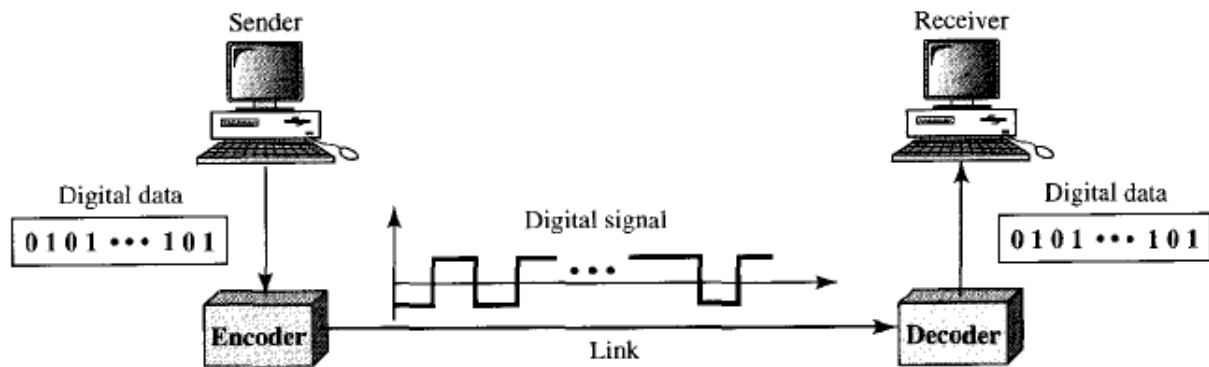
Question 4

Figure Q4

The figure Q4 above shows the process of Line Coding and Decoding. At the sender, digital data are encoded into a digital signal; at the receiver, the digital data are recreated by decoding the digital signal.

- (a) Show how the following sequence of bits can be encoded using Unipolar - NRZ (Non-Return to Zero) encoding.

1 0 1 0 1 1 0 1 0 0 1 0 1 0

(6 marks)

- (b) Show the same bit sequence encoded using Manchester encoding and Differential Manchester encoding..

(6 marks)

- (c) What are the advantages and disadvantages of Manchester encoding, compared to NRZ encoding?

(8 marks)

Question 5

- (a) In building automation system, the entire configuration can be depicted using a three-layer model. Outline the three-layer model and briefly describe their function.

(6 marks)

- (b) BACnet (Building Automation and Control Network) is a standardized data communication protocol developed by ASHRAE. BACnet is used in building automation to enable devices and systems to exchange information.

- i. What are the services categories offered by BACnet on its application layer?
- ii. What are the supported media links offered by BACnet?

(6 marks)

- (c) LonWorks is an open networking solution for building automation and control networks. LonWorks be used in centralized building automation controllers as well as in decentralized building control components. Describe the components of LonWorks technology.

(8 marks)

Question 6

- (a) The Open Systems Interconnection (OSI) model describes a seven layer hierarchy, intended for computer network and data communications, also as a framework for developing protocol standards. Outline the names of these layers and briefly describe their function.

(7 marks)

- (b) Both circuit switching and packet switching are two different technologies used to send messages over network. Distinguish the differences between circuit switching and packet switching.

(8 marks)

- (c) State three characteristics of attenuation in data transmission.

(5 marks)

END OF QUESTION