



ZIMBABWE EZEKIEL GUTI UNIVERSITY

**FACULTY OF SCIENCE, TECHNOLOGY, AGRICULTURE AND FOOD
SYSTEM DEVELOPMENT**

DEPARTMENT OF INFORMATION SYSTEMS

EXAMINATION PAPER

COURSE CODE : BIS215
COURSE TITLE : Data Communications and Networks
DURATION : 3 Hours
LEVEL : 2.1
DATE : 2024

12 JUN 2024

INSTRUCTIONS TO CANDIDATES:

1. There are five questions in this paper
2. Each question carries 25 marks
3. Answer ANY 4 questions.

Question One

- (a) Outline the major types of delays associated with communication networks with the aid of examples [10]
- (b) With reference to signal modulation explain four (4) major techniques used in modulation (8)
- (c) Outline and explain the process of error detection, control and correction mechanisms in data communications giving examples of error detection codes (7)

Question Two

- a) Giving all details, explain two differences between star and bus network topologies. (5)
- b) List any three OSI layers and explain their purpose (9)
- c) With the aid of a diagram, describe the TCP/IP layer model. (6)
- d) Name two well-known data transport protocols provided by the Internet Transport Layer. Provide a brief description of each service (5)

Question Three

- a) Describe the physical characteristics of the following transmission media. Also outline the advantages and disadvantages associated with each media and indicate under which environments or conditions each medium is mainly used.
 - i). Twisted pair (5 marks)
 - ii). Coaxial cable (5 marks)
 - iii). Optical cable (5 marks)
- b) Other possible choices for data communication infrastructure for long distance data transfer include microwave, and radio transmission. Discuss the advantages and disadvantages of each of these media, in terms of cost, political impact, ease of installation and adaptability in providing a range of services to clients. (10 marks)

Question Four

- a) What problem with data transmission in broadband coaxial cable network is addressed using multiplexing techniques? Name two types of multiplexing strategies, and identify how they differ from each other. (8 marks)
- b) Explain the following
- i). Synchronous Transmission. (4 marks)
 - ii). Asynchronous Transmission (4 marks)
 - iii). Ethernet (3 marks)
- c) With the aid of examples or otherwise, explain at **least three** differences between packet switching and circuit switching (6 marks)

Question Five

- (a) Suppose you were asked to set up a network that connects a Bindura based agro-processing plant with clients in South Africa. Identify at least 4 networking devices you need in order to achieve this. You must also fully explain the purpose served by each of the 4 devices you choose (12 marks)
- (b) In terms data communication and networks, explain the following terms:
- i). baseband (3 marks)
 - ii). broadband (3marks)
 - iii). Unguided transmission media (4 marks)
 - iv). Routing (3 marks)

The End

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