



MURANG'A UNIVERSITY COLLEGE
(A Constituent College of Jomo Kenyatta University of Agriculture and Technology)
University Examinations 2012/2013
SCHOOL OF BUSINESS AND ECONOMICS
EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS
INFORMATION TECHNOLOGY
HBT 2105: DATA COMMUNICATION AND NETWORKS
TIME 2 HOURS
SUPPLEMENTARY/SPECIAL EXAMINATIONS

Instructions: Answer Question 1 and Any Other Two.

Question ONE: (30 marks) - Compulsory

QUESTION ONE

- a) There are three main types of network topologies namely; star, ring and bus. As a network administrator, you have been asked to produce a briefing document that discusses each topology in terms of cabling cost, fault tolerance, data redundancy and performance as the number of nodes increases. (12 marks)
- b) Explain three advantages of packet switching over circuit switching. (6 marks)
- c) List and briefly explain four application areas for wireless LANs. (8 marks)
- d) Define the following terms
- | | |
|---------------------------|-----------|
| i.) Differential encoding | (2 marks) |
| ii.) Error control | (2 marks) |

QUESTION TWO

- a) Why are the wires twisted in twisted-pair copper wire? (3 marks)
- b) Explain four major limitations of twisted-pair wire? (4 marks)
- c) Describe the components of optical fiber cable. (5 marks)

- d) Explain two advantages and two disadvantages of microwave transmission? (8 marks)

QUESTION THREE

- a) Explain two functions are performed by an antenna? (5 marks)
- b) Differentiate between guided media and unguided media. (5 marks)
- c) What is the channel capacity for a teleprinter channel with a 300-Hz bandwidth and a signal-to-noise ratio of 3 dB, where the noise is white thermal noise? (6 marks)
- d) Explain four common ingredients for error control for a link control protocol. (4 marks)

QUESTION FOUR

- a) Explain the difference between NRZ-L and NRZI. (5 marks)
- b) Highlight three reasons for breaking a long data transmission up into a number of frames? (6 marks)
- c) Explain three advantages of sliding-window flow control compared to stop-and-wait flow control. (6 marks)
- d) Briefly explain the term piggybacking. (3 marks)

QUESTION FIVE

- a) Briefly explain four generic architectural components of a public communications network? (8 marks)
- b) List and briefly define three transmission techniques for infrared LANs. (6 marks)
- c) How does ATM differ from frame relay? (4 marks)
- d) What are the relative advantages and disadvantages of ATM compared to frame relay? (2 marks)