



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY YR 1 SEM II

HIGHER DIPLOMA IN COMPUTER STUDIES – HDIPCS 10A

EIT 3110: DATA COMMUNICATION

END OF SEMESTER EXAMINATIONS

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*

Answer question **ONE (COMPULSORY)** in section **A** and any other **TWO** questions from section **B**

This paper consists of **THREE** printed pages

SECTION A (30 marks)

Question 1 (Compulsory)

- a) Define Multiplexing as applied in data Communication (2 marks)
- b) Explain any **TWO** features of the following transmission modes
(i) Simplex
(ii) Half duplex
(iii) Dull duplex (3 marks)
- c) State any **SIX** reasons that led to the development of data communication standards (3 marks)
- d) State any **FOUR** key considerations that one needs to consider when selecting a transmission medium (4 marks)
- e) Outline **FOUR** components that make up a optical fibre communication link (4 marks)
- f) Define channel coding (2 marks)
- g) Explain the following terminologies as applied in data communication
(i) Signaling
(ii) Encoding
(iii) Modulation
(iv) Signaling element (4 marks)
- h) State any **SIX** advantage of installing computer networks (3 marks)
- i) State any **SIX** reasons for using different computer network topologies (3 marks)
- j) Outline any **TWO** ways of classifying computer networks (2 marks)

SECTION B (40 marks)

Question 2 (20 marks)

- a) Give **SIX** reasons for errors in data communication (3 marks)
- b) Describe the following terms as used in data communication
(i) Propagation delay
(ii) Jitter
(iii) White noise (6 marks)
- c) Distinguish between Forward Error Control (FEC) and Backward Error Control (BEC) (6 marks)
- d) Describe with the aid of a sketch how analog data is converted into digital using PCM (5 marks)

Question 3 (20 marks)

- a) State **TWO** types of computer network topology (2 marks)
- b) (i) Outline any **FOUR** advantages of bus topology (4 marks)
(ii) Outline any **FOUR** disadvantages of bus topology (4 marks)
- c) (i) Outline any **FOUR** advantages of ring topology (4 marks)
(ii) Outline any **FOUR** disadvantages of ring topology (4 marks)
- d) Name any **SIX** computer network devices (3 marks)
- e) Describe the importance of a bridge in a network (4 marks)
- f) (i) Define mesh networking
(ii) Describe the main advantage of mesh networking (3 marks)

Question 4 (20 marks)

- a) Describe the function of the following OSI reference model layers (6 marks)
 - (i) Data link
 - (ii) Network
 - (iii) Transport
- b) State any **THREE** reasons why IP Internet Protocol is said to be unreliable (3 marks)
- c) Outline any **SIX** properties specified by most data communication protocols (3 marks)
- d) Describe any **FOUR** transmission medium impairment (8 marks)

Question 5 (20 marks)

- a) State any **TEN** advantages of optical fibre (5 marks)
- b) Describe briefly any **FOUR** optical fibre power losses (4 marks)
- c) Outline any **SIX** connector losses in optical fibre (3 marks)
- d) Name any **FOUR** types of multiplexing (4 marks)
- e) Outline **FOUR** disadvantages of Statistical Time Division Multiplexing (4 marks)