



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN
BACHELOR OF TECHNOLOGY IN INFORMATION & COMMUNICATION
TECHNOLOGY (BTech. ICT. 11M)

BIT 2107: NETWORK ESSENTIALS

END OF SEMESTER II EXAMINATION

SERIES: DECEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consist of **FIVE** questions in **TWO** sections **A & B**

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

SECTION A (Compulsory)

QUESTION 1 (30 marks)

- a) Find the classes and the subnet mask of the following IP addresses
- i. 217.14.2.1
 - ii. 139.14.6.8
 - iii. 114.34.2.8
- [3 Marks]
- a) Outline any **EIGHT** reasons that led to network standards
- [4Marks]
- b) Outline any **FOUR** reliability issues that are addressed by TCP to provide a reliable byte stream:
- [4 Marks]
- c) Outline any **FOUR** properties of network protocols
- [4 marks]
- d) Describe any **FOUR** key factors that are considered in selecting a transmission media
- [4 Marks]
- e) Describe any **TWO** conditions for total internal reflection in optical fibre
- [4 marks]

- f) Outline any **FOUR** factors that distinguish packet switching from circuit switching. [4 Marks]
- g) Explain any **THREE** types of computer network bridges [3 Marks]

SECTION B (Attempt any TWO questions)

QUESTION TWO [20 marks]

- (a) Describe a multilayered switch in computer networks [2 Marks]
- (b) Explain any **FOUR** ways of classifying computer networks [8 Marks]
- (c)(i) Define medium access method
(ii) Outline the purpose of medium access methods [10 marks]

QUESTION THREE [20 marks]

- (a) Explain any **FOUR** non-connector based power losses in optical fibre [4 marks]
- (b) (i) Define multiplexing as applied in computer networks
(ii) Outline any **FOUR** forms of multiplexing commonly employed in computer networks [3 marks]
- (c) Describe the function of the following OSI layer [4 marks]
(i) Transport -
(ii) data link -
- (d) Compare and contrast any **THREE** network topologies in terms of their strengths and weakness [6 Marks]
- (e) Outline any **THREE** advantages of installing network bridges [3 Marks]

QUESTION FOUR [20 marks]

- (a) (i) Define Asynchronous Transfer Mode ATM
(ii) Outline any **SIX** characteristics of ATM [7 Marks]
- (b) Outline any **SIX** characteristics of Frame relay [6 Marks]
- (c) (i) Explain any **TWO** routing requirement in packet switched networks
(ii) Describe Adaptive routing
(iii) State any **THREE** advantages of adaptive routing [7 marks]

QUESTION FIVE [20 marks]

- (a) Outline any **THREE** techniques used to transfer data, that may be used by the NIC [6 marks]
- (b) Outline any **FOUR** functions of a router/router switch [4 marks]
- (c) State any **FOUR** disadvantages of network bridges [4 Marks]
- (d) Encode the following bit stream 1100000011 using

- (i) Bi-phase S
- (ii) Differential Manchester
- (iii) Bipolar AMI with HDB3

[6 marks]