



MASINDE MULIRO UNIVERSITY OF

SCIENCE AND TECHNOLOGY

(MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

MAIN EXAM

2021/2022 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER EXAMINATION

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION
TECHNOLOGY**

COURSE CODE: BIT 420E/BCS 474

COURSE TITLE: ADVANCED WIRELESS AND MOBILE NETWORKS

DATE: Friday 22/04/2022

TIME: 8:00a.m-10:00a.m

INSTRUCTIONS TO CANDIDATES:

**SECTION A IS COMPULSORY. ANSWER ANY OTHER TWO QUESTIONS IN
SECTION B**

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

Paper Consists of 2 Printed Pages. Please Turn Over 

SECTION A [COMPULSORY]: 30 MARKS

QUESTION ONE

- a) Differentiate between cellular and wireless networks [4 MARKS]
- b) Differentiate between hierarchical state routing and AD Hoc On-Demand Distance Vector routing [4 MARKS]
- c) Discuss THREE major Types of Attacks On Mobile Networks [6 MARKS]
- d) Describe the functional Architecture of a GSM System [8 MARKS]
- e) Discuss THREE features of cellular networks [6 MARKS]
- f) Explain TWO Structures of the mobile phone cellular network [2 MARKS]

QUESTION TWO (20 MARKS)

- a) Homes usually use wireless communication protocols to connect computers, smartphones and laptops. Discuss TWO standardized and widespread wireless protocols used in those technologies. [4 MARKS]
- b) Mobile Ad hoc Networks are wireless networks which are characterized by dynamic topologies and no fixed infrastructure. Discuss FOUR properties of MANETs [8 MARKS]
- c) Computers are often connected to networks using wireless links e.g. WLANs. Discuss FOUR wireless links used in networks. [8 MARKS]

QUESTION THREE (20 MARKS)

- a) Giving examples to each, Discuss FOUR types of Wireless networks [10 MARKS]
- b) Dynamic Source Routing protocol is a simple and efficient routing protocol designed specifically for use in multi-hop wireless ad hoc networks of mobile nodes. It allows the network to be completely self-organized and self-configured, without the need for any existing network infrastructure or administration. Discuss the advantages and disadvantages of Dynamic Source Routing protocol in an organization. [10 MARKS]

QUESTION FOUR (20 MARKS)

- a) The wireless markup language is based on the standard HTML known from the www and on HDML. Discuss TWO features of WML [4 MARKS]
- b) Distinguish between shortest distance algorithm, proactive algorithm and link state algorithm [6 MARKS]
- c) Securing wireless and cellular networks is a highly challenging issue. Understanding possible form of attacks is always the first step towards developing good security solutions. Discuss FIVE challenges associated with wireless and mobile networks [10 MARKS]

QUESTION FIVE (20 MARKS)

- a) State and explain FIVE characteristics of mobile ad hoc networks [5 MARKS]
- b) Describe FIVE entities of Mobile IP [5 MARKS]
- c) Discuss FIVE types of protocols in wireless and cellular networks [5 MARKS]
- d) In the WAP environment, both the network and the WAP servers can be connected to the public Internet, i.e. the WAP stack and the servers are exposed to attacks. Discuss FIVE threats and protection methods in such scenario [5 MARKS]