



TECHNICAL UNIVERISTRY OF MOMBASA

# Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR DEGREE IN:  
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY  
(BTIT 14S)

**EIT 4111: ICT & SOCIETY**

END OF SEMESTER EXAMINATION  
**SERIES: APRIL 2015**  
**TIME: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.

Attempt 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

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**Question One (Compulsory)**

a) Explain the difference between the following terms:

(i) “Compute error” and “Compute failure”

(ii) “Firewall” and “intrusion detection system”

(iii) “Overt Surveillance” and “covert surveillance”

**marks)**

**(12**

b) List any **THREE** categories of surveillance activities

**(4 marks)**

c) (i) Explain the term “Anonymity”

**(2 marks)**

(ii) Explain FOUR disadvantages of using computers (4 marks)

- d) (i) Explain the term “Telecommuter” (2 marks)  
(ii) Briefly describe any THREE categories of telecommuters. (6 marks)

### Question Two

- a) The benefits of computing technology to health care are numerous and very impressive. Yet one of the classic case study of a deadly software failure is a medical device. A radiation treatment machine. The Therac-25 was a software controlled radiation therapy machine used to treat people with cancer. Between 1985 and 1987, Therac-25 machines at four medical centres gave massive overdoses of radiation to six patients. In some cases the operator repeated an overdose because the machine’s display indicated it had given no dose. Medical personnel later estimated that some patients received more than 100 times the intended dose. These incidences caused severe and painful injuries and deaths of three patients. Medical physicist operating a different radiation-treatment machine in Panama in year 2000 tried to circumvent a limitation in an attempt to provide more shielding for patients. The actions caused dosage miscalculations. Twenty-eight patients received overdoses of radiation, and several died. It seen the dramatic lessons need repetition with each new generation. In the context of this case study:
- (i) Explain the term “software failure” (2 marks)
  - (ii) Outline any FOUR benefits of computing technology in health case (8 marks)
  - (iii) Why were there so many incidents of overdose? (1 mark)
  - (iv) State any THREE lessons you have learned from Therac-25 case study (3 marks)
  - (v) Identify one case in which reuse of software caused a serious problem (2 marks)
- b) Explain the difference between “Fault avoidance and “fault tolerance” (4 marks)

### Question Three

- a) After the fall of the communist government in East Germany, people examined the files of stati, the secret police. They found that the government had used spies and informants to build detailed dossiers on the obvious and activities of roughly six million people-a neighbours, co-workers, friends and even family members of the people they reported on. The paper files filled an estimated 125 miles (= 200kms) of shelf space. Required:
- In this context:
- (i) Explain the term “Privacy” (2 marks)
  - (ii) Explain any TWO ways a database management system would have assisted stati. (2 marks)
  - (iii) In digital age, describe any THREE advantages of surveillance cameras (6 marks)
  - (iv) Outline any FIVE categories of threats to privacy (10 marks)

### Question Four

- a) Physical security can be guaranteed if the following four mechanisms are in place: deterrence, prevention, detection and response. Describe these mechanisms (8 marks)
- b) (i) Explain the term “Information Security” (2 marks)  
(ii) Explain any THREE attributes of privacy (6 marks)
- c) (i) Explain the term “freedom of speech”  
(ii) Describe any FOUR types of speeches you consider to be obscene (4 marks)

### **Question Five**

- a) The electronic workplace has provided management with a wealth of new possibilities for monitoring employees in their drive to reduce ever-increasing workplace costs. In the context of this statement:
- (i) Explain any THREE categories of surveillance devices **(6 marks)**
  - (ii) Describe any FOUR consequences of electronic monitoring **(8 marks)**
- b) There are several types of anonymities. Describe any THREE of them **(6 marks)**