



DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY
UNIVERSITY EXAMINATION 2021/2022
FIRST YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE
OF BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONIC
ENGINEERING
&
BACHELOR OF SCIENCE IN TELECOMMUNICATION AND
INFORMATION ENGINEERING

EEE/ETI 1101 INTRODUCTION TO ENGINEERING AND
COMPUTING

DATE: JANUARY 2022

TIME: 2 HOURS

Instructions

This examination paper contains **FIVE** questions.

Attempt **compulsory QUESTION ONE** and **any other TWO** questions.

QUESTION ONE (Compulsory)

- a) What is the main difference between science and engineering? **(1 Mark)**
- b) Define the following terms fundamental terms as used in the fields of electrical/telecommunication engineering. **(5 Marks)**
- i. Electromagnetism
 - ii. Telecommunication
 - iii. Network
 - iv. Electric charge
 - v. Current
- c) A resistor is marked as follows:
- 1st band Brown
 - 2nd band Black
 - 3rd band Orange
 - No other band
- What is its resistance and between what values does it lie? **(2 Marks)**
- d) Although it is possible for engineers to work alone, more commonly they work with a group of support personnel. The engineer and the support personnel comprise the engineering team, and the roles of each specialty group are often

described in terms of an occupational spectrum. Discuss this spectrum in details. **(4 Marks)**

- e) Discuss the following specialties of engineering while giving their branches. Describe in detail the matters that concern each branch. **(5 Marks)**
- i. Electrical and electronic Engineering
 - ii. Materials engineering
 - iii. Mechatronics engineering
 - iv. Industrial engineering
 - v. Aerospace engineering
- f) Discuss any five roles of engineers in National Economic Development. **(5 Marks)**
- g) A motor gives an output power of 20 kW and operates with an efficiency of 80 per cent. If the constant input voltage to the motor is 200 V, what is the constant supply current? **(1 Marks)**
- h) A 200ton train experiences wind resistance equivalent to 62.5 N/t. The operating efficiency of the driving motors is 0.87 and the cost of electrical energy is 8 ksh/kW h. What is the cost of the energy required to make the train travel 1 km? If the train is supplied at a constant voltage of 1.5 kV and travels with a velocity of 80 km/h, what is the supply current? **(4 Marks)**
- i) Discuss the Fifth (5th) Generation Computers. Give their main uses, applications, and examples of these computers. **(3 Marks)**

QUESTION TWO

- a) Differentiate between the electromotive force and the potential difference as used in electrical and electronic engineering. **(1 Mark)**
- b) Compile a list of products and services that are not available now that you think will be readily available in the next 50 years. Explain their applications. **(5 Marks)**
- c) The engineering design process is a series of steps that engineers follow to find a solution to a problem. While the design process is iterative it follows a predetermined set of steps, some of these may need to be repeated before moving to the next one. This will vary depending on the project itself, but allows lessons to be learnt from failures and improvements to be made. Discuss in depth the 8 steps involved in the engineering design process. **(4 Marks)**
- d) List and discuss in detail the basic steps in engineering problem solutions. **(4 Marks)**
- e) A code of ethics is a guide of principles designed to help professionals conduct business honestly and with integrity. A code of ethics, also referred to as an "ethical code," may encompass areas such as business ethics, a code of

professional practice, and an employee code of conduct. Give **five** examples of engineering codes of ethics in relation to practice. **(5 Marks)**

- f) Differentiate between the Random Access Memory (RAM) and the Read Only Memory (ROM). **(1 Mark)**

QUESTION THREE

- a) Discuss why engineering ethics is so important, and explain why engineers are expected to practice engineering using the highest standards of honesty and integrity. **(5 Marks)**
- b) Create a list of products and services that are available today that were not available before the 1990s. Find out if people ever imagined that these products and services would be available today. To get you started, here are few examples: cellular phones, ATM cards, personal computers, airbags in cars, price scanners at the supermarket, E-Z Passes for tolls, and so on. Explain how these products have made their lives better (or worse). **(5 Marks)**
- c) Computers can be generally classified by their size and power usage, though there is considerable overlap. Based on this, discuss the **five** classes of computers involved. In each class give **two** examples of this computers. **(5 Marks)**
- d) Although the activities of engineers are quite varied, there are some personality traits and work habits that typify most of today's successful engineers. Discuss any **ten** common traits of good electrical/telecommunication engineers **(5 Marks)**

QUESTION FOUR

- a) Modern Engineering includes technology, but is also concerned with development and understanding of technological systems and the products, affects and appropriateness of technology. It is also concerned with non-technological approaches Observe your own surroundings. What are some of the engineering achievements that you couldn't do without today? Discuss in detail. **(5 Marks)**
- b) What is computer-aided-design (CAD)? **(1 Mark)**
- c) The Computer Applications program is designed to provide the skills needed in the use of application software on a computer. Discuss **ten** major application

areas in the modern-day society. In each discussion, list two or more specific uses. **(5 Marks)**

- d) Over 40 universities in the Republic of Kenya offer bachelor's-degree programs in engineering that are accredited by the Engineers Board of Kenya (EBK). EBK examines the credentials of the engineering program's faculty, curricular content, facilities, and admissions standards before granting accreditation. Describe any **ten** educational outcomes that are expected of a graduate engineer from an engineering program. **(5 Marks)**
- e) Within a given engineering field of specialization, there is a wide range of functions or activities in which engineers may be involved **(8)**. Engineers can be involved in some combination of these functions, and, conceivably, could perform all of them over the course of a career. State and discuss these activities. **(4 Marks)**

QUESTION FIVE

- a) Define the following terms as used in used in computer systems? **(5 Marks)**
- i. Software
 - ii. Data
 - iii. Information
 - iv. Knowledge
 - v. Nibble
- b) Compare between the Application Software and System Software by use of the following table. **(4 Marks)**

	Application Software	System Software
Definition		
Example		
Interaction		
Dependency		

- c) The characteristics of a person or thing are the qualities or features that belong to them and make them recognizable. In other words, a quality or feature that is characteristic of someone or something is one which is often seen in them and seems typical of them. Explain the **five** major characteristics of computers. **(5 Marks)**
- d) A Profession is a disciplined group of individuals who adhere to ethical standards and who hold themselves out as, and are accepted by the public as

possessing special knowledge and skills in a widely recognised body of learning derived from research, education and training at a high level, and who are prepared to apply this knowledge and exercise these skills in the interest of others Although it differs significantly from other professions in several respects, engineering possesses those attributes that characterize a profession, name **five** of them. **(5 Marks)**

e) Discuss the field of Bioengineering

(1 Mark)
