



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN INSTRUMENTATION AND CONTROL ENGINEERING (DICE4)

TELEMETRY & NETWORKING I

ETI 2231

END OF SEMESTER EXAMINATION

SERIES: MAY 2016

TIME: 2 HOURS

DATE: Pick Date Select Month Pick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **five** Questions;. Attempt any **THREE** Questions.

Do not write on the question paper.

Question ONE

- With the aids of a well labeled schematic diagram describe the operation of a direct voltage Telemetry system. (12 marks)
- Outline **TWO** advantages and **TWO** disadvantages of direct voltage telemetry system (4 marks)
- Outline the measures recommended for minimizing transmission error in a voltage telemetry system (4 marks)

Question TWO

- a) Sketch and describe the block diagram of a typical telemetry system (10 marks)
- b) Distinguish between Electrical and Mechanical telemetry system outlining one advantage of each (4 marks)
- c) **STATE** and briefly describe the **THREE** signal transmission media commonly employed in Telemetry systems (6 marks)

Question THREE

- a) Describe and Justify the need for process of signal modulation and demodulation in a Telemetry system (4 marks)
- b) With the aid of a block diagram, describe the process of modulation technique (8 marks)
- c) Describe the following types of modulation
 - i) Amplitude Modulation
 - ii) Frequency Modulation
 - iii) Pulse modulation
 - iv) Pulse Amplitude Modulation

Question FOUR

- a) Describe the **THREE** modes of signal transmission in typical telemetry systems (3 marks)
- b) State the types and importance of serial and parallel transmission standards for industrial data (6 marks)
- c) List **FOUR** industrial instrumentation Communication buses stating their typical applications in telemetry (8 marks)
- d) Outline the importance of incorporating safety measures in process telemetry (3 marks)

Question FIVE

- a) Describe the need for process data multiplexing and de-multiplexing in Telemetry systems (4 marks)
- b) Describe the working principle of the following methods of multiplexing as employed in a telemetry system
 - i) TDM
 - ii) CDM
 - iii) FDM
 - iv) WDM (8 marks)

- c) Briefly explain the role of telemetry system in industrial processes, state a typical example application (4 marks)