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**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

**UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
FIFTH YEAR SECOND SEMESTER EXAMINATIONS**

SPECIAL/ SUPPLIMENTARY

**FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN MECHANICAL AND
INDUSTRIAL ENGINEERING**

COURSE CODE: MIE 552E

COURSE TITLE: INDUSTRIAL ROBOTICS

DATE: FRIDAY 7/10/2021

TIME: 3.00 - 5.00 PM

INSTRUCTIONS TO CANDIDATES

Question ONE (1) is compulsory
Answer Any Other TWO (2) questions

TIME: 2 Hours



MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over.

QUESTION ONE

- i. Define the following terms: pitch, roll, yaw and work volume. (5 Marks)
- ii. Sketch a robot and name its parts (9 Marks)
- iii. With a neat sketch explain the three degrees of freedom associated with the robot wrist. (10 Marks)
- iv. What is an end effector? Give 5 examples of tools as robot end effector. (6 Marks)

QUESTION TWO

(20 Marks)

Discuss the various performance characteristics of actuators. Compare electrical, pneumatic and hydraulic actuators for their characteristics

QUESTION THREE

- i. Explain the different safety considerations for robot operations. (10 Marks)
- ii. Explain the mechanism, advantages and disadvantages of application robot in welding. (10 Marks)

QUESTION FOUR

- i. Sketch a robot wrist and explain its joint movements (10 Marks)
- ii. Briefly explain the need for robots in industries (10 Marks)