



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

EMM 414: INDUSTRIAL ERGONOMICS

DATE: 24/7/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Answer Question One and Any Other Two Questions

QUESTION ONE

- a) explain the four factors considered in assessing the fit between a person and their work, (12 marks)
- b) To assess the fit between a person and their work, you have to consider a range of factors, including (9 marks)
- c) Discuss three ways of applying ergonomics to the workplace (9 marks)

QUESTION TWO

- a) Explain FOUR Typical ergonomic problems found in the workplace and in each case explain how these problems may lead to ergonomics issues (12 marks)
- b) Illustrate and explain the Basic Human-Machine Interaction model as applied in industrial ergonomics (8 marks)

QUESTION THREE

- a) As a project Officer outline the procedure of assessing if there are ergonomics problems in the metalwork engineering workshop? (11 marks)
- b) Explain how the following three specialist fields apply to industrial ergonomics of posture and movement,

- i. Biomechanical
 - ii. Physiological
 - iii. Anthropometric
- (9 marks)

QUESTION FOUR

- a) Describe the three types of measure that can be applied to reduce or eliminate the adverse effects of noise as environmental factors in the workplace (12 marks)
- b) Describe Three variables that are important in assessing vibrations, hence explain how vibration can be reduced in work place (8 marks)

QUESTION FIVE

- a) Explain the FIVE principles related to ergonomics in Design for Manufacture and Assembly (DFMA) (10 marks)
- b) Explain FIVE MAIN criteria that must be met if the tasks have to be combined into interesting jobs for people (10 marks)