



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

EMM 414: INDUSTRIAL ERGONOMICS

DATE: 23/5/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS:

Answer Question One and Any Other Two Questions

Use clear and neat diagrams

QUESTION ONE (30 MARKS) (COMPULSORY)

Mrs Fatuma is a technician engineer in-charge of ergonomics Department at Machakos Metal and Ceramics Manufacturing Industry. She has approached you as a training consultant in the following areas

- Social Significance of ergonomics to Machakos Metal and Ceramics Manufacturing Industry
- Ergonomics problems found in the workplace and mitigation measures
- Posture and movements in the workplace with focus to lifting and change of posture

Prepare a technical training manual as per the following template:

- | | | |
|----|--|-----------|
| a) | Title: | (2 marks) |
| b) | Introduction | (2 marks) |
| c) | Significance of Ergonomics in manufacturing Industry | (4 marks) |
| d) | Ergonomics problems found in the workplace and mitigation measures | (8 marks) |
| e) | Posture and movements in the workplace in lifting | (6 marks) |
| f) | Principles of Biomechanical | (6 marks) |
| g) | Conclusion | (2 marks) |

QUESTION TWO (20 MARKS)

- a) Describe three factors to consider in assessing fit to the work (6 marks)
- b) As a project Officer outline the procedure of assessing if there are ergonomics problems in a metalwork engineering workshop? (14 marks)

QUESTION THREE (20 MARKS)

- a) Design two principles related to Physiological (8 marks)
- b) Discuss two applications of anthropometric in ergonomics (12 marks)

QUESTION FOUR (20 MARKS)

- a) Describe the following two information and operation ergonomics consideration in metal working industry (8 marks)
 - i. Visual information
 - ii. Use of operation Controls
- b) Discuss the three types of measure that can be applied to reduce or eliminate the adverse effects of noise as environmental factors in the industry (12 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss the best posture and movement ergonomics consideration in a manufacturing industry based on : (8 marks)
 - i. Sitting workstation
 - ii. Change of posture
- b) Illustrate and explain the Basic Human-Machine Interaction model as applied in industrial ergonomics (12 marks)