



## KENYATTA UNIVERSITY

### UNIVERSITY EXAMINATIONS 2011/2012

#### FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (MECHANICAL & MANUFACTURING ENGINEERING)

#### SET 508: MANUFACTURING SYSTEMS DESIGN

**DATE:** Wednesday 30<sup>th</sup> November, 2011

**TIME:** 2.00 p.m. – 4.00 p.m.

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#### INSTRUCTIONS

- 1) The paper consists of **Four Questions**
- 2) Each Question Carries **20 Marks**
- 3) Answer **ANY THREE** Questions

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#### QUESTION ONE

- a) With reference to real case, illustrate the differences between process focused and product focused (4Mks)
- b) Explain how the product life cycle impacts on product design (4 marks)
- c) K&K5 Company has introduced Just in Time manufacturing system, for its operations.
  - i) Explain the Just in Time manufacturing system
  - ii) Describe Three measure that K&K5 Company needs to undertake towards eliminating waste (8Mks)
- d) Describe the differences between pull manufacturing systems and push manufacturing systems types of production organization and control systems (4Mks)

## **QUESTION TWO**

a) Illustrate the following three process flow analysis strategies as applied to manufacturing systems.

- i) Make-to-stock strategy.
- ii) Assemble-to-order strategy
- iii) Make-to-order strategy

(6Mks)

b).Using practical case Describe the process of developing new product design (10 Mks)

c).Explain how break even analysis tool is used in evaluating a new product or process (4 Mks)

## **QUESTION THREE**

a). Describe and give an example the following three general manufacturing systems approaches as applied to the processing area

- i) Job shop
- ii) Project shop
- iii) Cellular systems

(6 Mks)

b). Distinguish between volume flexibility and product flexibility as applied to manufacturing flexibility systems (4 Mks)

c). Explain the four classes of manufacturing attributes to be considered when making manufacturing decisions (4 Mks)

d). Define the process flow analysis and hence with aid of flow charts illustrate the following process elements used in developing a process design

- i) Multi stage process with buffers
- ii) Parallel stage producing same product

(6 Marks)

#### **QUESTION FOUR**

- a) Explain the use of technology in manufacturing and describe how the following two types of technologies that significantly enhance manufacturing system designs
- i) flexible manufacturing system
  - ii) Automation
- (8 Mks)
- b) Explain four factors that impacts on product and process designs. (8 Mks)
- c). Describe and illustrate the following two broad categories of processes
- i) Intermittent operations
  - ii) Repetitive operations
- (4 Marks)

\*\*\*\*\* End\*\*\*\*\*