



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2011/2012

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
SET 511: MANUFACTURING PROCESSES III

DATE: Monday 5th December, 2011

TIME: 8.00 a.m. – 10.00 a.m.

INSTRUCTIONS: *Answer any THREE questions.*

Q1

- a) Give an overview of the various types of metal shaping processes (5marks)
- b) Mention the various types of NTM processes (5marks)
- c) Describe WJM and AWJM. (5marks)
- d) ECM and Chemical Etching (5marks)

Q2

What is EDM, describe the principle of metal removal in EDM. (5marks)

In a pulsed EDM discuss the effect that

- (i) Pulse or current height (ii) Frequency and (iii) Duty factor

have on

- (a) Material removal rate MRR (b) surface finish and (c) tool wear. (15marks)

Q3

Explain the principle of gas flame welding and cutting. Draw the gas flame shape and chemical equation. Differentiate between carburizing and oxidizing flames. (5marks)

Give short notes on

- (a) arc welding, (3marks)
- (b) spot welding, (3marks)
- (c) forge welding, (3marks)
- (d) TIG and submerged arc welding (6marks)

Q4

a) Explain and show by schematic drawings the various components of

(i) Laser beam machining and electron beam machining (5marks)

(ii) Ultra sonic machining and plasma and laser cutting (5marks)

b) (i) Explain G-Code and M-Code as used in CNC programming. (5marks)

(ii) A shaft is to be turned from 25mm to 20 mm diameter on a CNC write a short program to machine the part. (5marks)

Q5

Explain rapid prototyping and **Regenerative manufacturing** Production of solid products with particular reference to

a) stereo lithography (5marks)

b) selective sintering (5marks)

c) LOM (laminated object manufacturing) (5marks)

d) FDM. (Fused Deposition Modelling) (5marks)