



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR
OF SCIENCE (MECHANICAL ENGINEERING)

EMM 315: MATERIAL FORMING PROCESSES

DATE: Thursday, 19th April, 2012

TIME: 2.00 p.m. – 4.00 p.m.

INSTRUCTIONS:

The Paper Consists of **FOUR** questions.

Answer any **THREE (3)** questions.

Use clear and neat diagrams.

Answer books provided.

All questions carry 20 equal marks each.

Question One

- a) Explain the following metal forming processes
 - i) Cold Rolling
 - ii) Hot Rolling

(4 marks)
- b) With the aid of sketches describe the sequence of steps in a typical fine-blanking operation that uses a compound die that both blanks and pierces the sheet material

(10 marks)
- c) The Washers of 30mm Outside diameter and 15mm inside diameter are to be made by press work from Mild Steel sheet of 1mm thickness, assuming an allowance of 3% for Mild steel Sheet determine

- i) Clearance
- ii) Dimensions for piercing tool
- iii) Dimensions for blanking tool

(6 marks)

Question Two

- a) Briefly describe the principles of the following Casting operation
investing casting
Die casting
(6 marks)
- b) With the aid of sketches describe the shell molding process (6 marks)
- c) With an aid of a flow diagram explain the common manufacturing operation for a ceramic component (8 marks)

Question Three

- a) With the aid of well labeled diagram describe the principles of co-injection molding of a plastic object. (8 marks)
- b) Describe slip-ring forming process (5 marks)
- c) Describe one main process that is used for making parts of reinforced plastics that have constant cross sections of any length (7 marks)

Question Four

- a) What is the difference between Glass and Ceramics? (2 marks)
- b) Briefly explain three basic steps involved in the process of Glassmaking (9 marks)
- c) With an aid of a flow diagram explain the common manufacturing operation for a ceramic component (6 marks)
- d) Explain the main role matrix and binders in the manufacture of composite materials (3 marks)