Name:_____ Index No. _____/_____

1501/205
PRODUCTION PROCESSES TECHNOLOGY
Oct./Nov. 2015
Time: 3 hours

Candidate's Signature:_____

Date: _____

THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN MECHANICAL ENGINEERING (PRODUCTION OPTION)

MODULE II

PRODUCTION PROCESSES TECHNOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.
Sign and write the date of the examination in the spaces provided above.
You should have drawing instruments and non programmable scientific calculator for this examination.
*This paper consists of **EIGHT** questions.*
*Answer any **FIVE** questions in the spaces provided in this paper.*
All questions carry equal marks.
Maximum marks for each part of a question are as indicated.
Candidates should answer the questions in English.

For Examiner's Use Only

Questions	1	2	3	4	5	6	7	8	TOTAL SCORE
Candidate's Score									

This paper consists of 20 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

1. (a) Explain the functions of each of the following parts of a shaper stating the Materials used in making each part:

(i) Ram;
(ii) Cross rail;
(iii) column (body).

(9 marks)

(b) With the aid of a sketch, explain the working principle of a shaper. (11 marks)

2. (a) Explain each of the following as a applied to grinding wheels:

(i) Abrasive;
(ii) Grain size;
(iii) Grade;
(iv) Structure.

(8 mark)

(b) Explain the meaning of the mark 38A60K8VG on a grinding wheel. (7 marks)

(c) Highlight the procedure of balancing a grinding wheel. (5 marks)

3. (a) Explain each of the following terms as applied to patterns in a casting process:

(i) gating;
(ii) riser;
(iii) core.

(6 marks)

(b) Explain **seven** major steps involved in the preparation of sand casting. (14 marks)

4. (a) Explain the functions of each of the following lathe machine parts and tools:

(i) mandrel;
(ii) chuck;
(iii) tail stock;
(iv) steady rest.

(8 marks)

(b) Illustrate the following lathe machine operations:

(i) plain turning;
(ii) facing;
(iii) step turning;
(iv) centering.

(12 marks)

5. (a) State **four** types of tool wear.

(4 marks)

(b) Explain **three** ways of defining tool life.

(6 marks)

(c) List **five** functions of cutting fluids. (5 marks)

(d) State **five** properties of cutting fluids. (5 marks)

6. (a) Explain each of the following forging terms:

(i) drop forging;
(ii) upset forging. (4 marks)

(b) With the aid of sketches, explain each of the following forging processes:

(i) roll forging;
(ii) drawing down;
(iii) swaging;
(iv) upsetting. (16 marks)

7. (a) State the functions of each of the following parts of a milling machine:

(i) saddle;
(ii) table;
(iii) knee;
(iv) base;
(v) column. (5 marks)

(b) With the aid of sketches, explain each of the following milling operations:

(i) side milling;
(ii) plain or stab milling;
(iii) face milling. (15 marks)

8. (a) State **two** differences between each of the following:

(i) Metal Inert Gas (MIG);
(ii) Tungsten Inert Gas (TIG). (4 marks)

(b) With aid of a sketch, explain the principle of submerged Arc Welding. (16 marks)