



**PROGRAM** : NATIONAL DIPLOMA  
ENGINEERING METALLURGY

**SUBJECT** : FOUNDRY TECHNOLOGY II

**CODE** : FTY21-1

**DATE** : SSA EXAMINATION  
23 JULY 2015

**DURATION** : (X-PAPER) 8:00 - 11:00

**WEIGHT** : 40 : 60

**TOTAL MARKS** : 97

**FULL MARKS** : 90

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**EXAMINER** : MR JW DE BEER

**MODERATOR** : DR K NYEMBWE

5095

**NUMBER OF PAGES** : 3 PAGES

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**INSTRUCTIONS** : QUESTION PAPERS MUST BE HANDED IN.

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**INSTRUCTIONS TO CANDIDATES:**

PLEASE ANSWER ALL THE QUESTIONS.

**QUESTION 1**

- 1.1 Name five (5) material removal processes used to manufacture metal parts. (5)
- 1.2 What limitations exist for foundry technology as a manufacturing technique? (3)
- 1.3 Define the following terms used in foundry technology:
- 1.3.1 Cope. (1)
  - 1.3.2 Facing sand. (1)
  - 1.3.3 Aggregate moulds. (1)
  - 1.3.4 Synthetic sand. (1)
  - 1.3.5 Segregation (of sand) (1)

**[13]**

**QUESTION 2**

- 2.1 You perform daily Loss on Ignition tests on resin sand samples in the foundry where you work. The latest test results show an LOI value of 3.3%
- a) Describe the testing procedure for the LOI test including equipment used and sample requirements. (5)
  - b) What does the LOI test result tell us about the sand? (3)
  - c) What steps should be taken, if any, to adjust the LOI of this sand? (3)
- 2.2 Chemical purity is important when using silica sand as moulding material. Give examples of impurities and how they affect the moulding sand. (6)
- 2.3 What are the advantages of the furan binder system? (4)
- 2.4 Name three (3) heat triggered moulding or core making processes. (3)

**[24]**

**QUESTION 3**

- 3.1 What are the advantages of the Shell/Croning moulding process? (7)
- 3.2 Discuss sand milling, differentiating between the types of mills. (9)

**[16]**

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**QUESTION 4**

- 4.1 Which five factors must be considered when choosing a mould coat? (5)
- 4.2 What function does the “rheology control system” perform in a mould coat? (3)
- 4.3 Metal penetration is physical effect that occurs when molten metal enters sand moulds. Write brief notes discussing the factors that will influence the degree on penetration. (8)

**[16]**

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**QUESTION 5**

- 5.1 Discuss “agitation during freezing” as a practical method for grain refinement in castings. (8)
- 5.2 Explain inoculation of SG (Ductile) irons. (10)
- 5.3 Explain in your own words two (2) methods of melt quality control used in foundries. (10)

**[28]**

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