PROGRAM		BACHELOR OF TECHNOLOGY *EXTRACTION METALLURGY*
SUBJECT		**INDUSTRIAL MINERALS 4**
CODE		**MIL41-1**
DATE	:	SUMMER SSA EXAMINATION 2017 10 JANUARY 2017
DURATION	:	(SESSION 3) 15:00 - 18:00
WEIGHT		40 : 60
TOTAL MARKS		100

ASSESSOR	Ms MAPILANE MADIBA
MODERATOR	MARCEL KALEMBA
NUMBER OF PAGES	4 PAGES AND A 2-PAGE ANNEXURE

INSTRUCTIONS

- First read carefully through all questions; only then
- Answer all questions in any sequence – but
- Please start answering each question on a new page
- Calculators are permitted

QUESTION 1 [20]

Diamond

Develop a very simple flowsheet where you do not expect big diamonds. Explain each step and the way of it

QUESTION 2 [20]

Heavy Sand Minerals

You are employed by Richards Bay Minerals (RBM). Give the flowsheet and explain different major steps.

QUESTION 3 [15]

Vanadium oxide

Explain why vanadium is a good alloying element and why is it preferred to niobium? Be specific.

QUESTION 4 [10]

You are a Mintek's employee and are presenting the new process developed by Mintek Pyrometallurgy division. An attendant does not see any substantial difference between the Pidgeon process and the Mintek process. Explain thermodynamically the differences and similarities between the two processes

QUESTION 5 [15]

Manganese oxide

Explain the mechanism of manganese oxide reduction. Emphasize on the thermodynamics of all different transformations taking place during the process. Be specific by giving all required chemical reactions.

QUESTION 6 [20]

Ferrosilicon

You are required to produce ferrosilicon. Discuss a way forward how you would handle the process and what is the mechanism (expected reactions) of ferrosilicon production. What are the main parameters that one would manipulate in order to make the process efficient?

TOTAL = 100