PROGRAM	:	NATIONAL DIPLOMA Extraction Metallurgy
SUBJECT	:	**Metallurgical Plant 2**
CODE	:	**MTP21-1**
DATE	:	SUMMER EXAMINATION 2014 7 NOVEMBER 2012
DURATION	:	(SESSION 1) 08:30 - 11:30
WEIGHT	:	40: 60
TOTAL MARKS	:	100

EXAMINER	:	MR M.B. KIME	Sanso Number
MODERATOR	:	Ms M MAPILANE	File Number
NUMBER OF PAGES	:	3 PAGES	

INSTRUCTIONS   : ALL THE ANSWERS MUST BE COMPLETED IN THE EXAM SCRIPS AND HANDED IN QUESTION PAPERS MUST BE HANDED IN.

REQUIREMENTS   : 1 POCKET CALCULATOR
NO CORRECTION FLUID SHALL BE USED ALL WORK SHALL BE HANDED IN.

METALLURGICAL PLANT 2: MTP21-1

INSTRUCTIONS TO CANDIDATES:

PLEASE ANSWER ALL THE QUESTIONS.

REFER TO FIGURES FOR FURTHER INFORMATION THAT MAY BE REQUIRED IN <u>ANSWERING THE QUESTION IN EACH CASE.</u>

QUESTION 1

A temperature difference of 306 °C is impressed across a fibreglass layer of 21 cm thickness. The thermal conductivity of the fibreglass is 0.035 W/ m.°C. Calculate the heat transferred through the material per hour per unit area.   **[25]**

QUESTION 2

Calculate ΔH_{rxn} for the following reaction:

$$S(g) + O_2(g) \rightarrow SO_2(g)$$
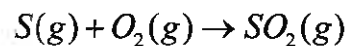
Given the following $\Delta H0f$ values:

$\Delta H^0 f\ (SO2,\ g) = -297\ kJ/mol$ **[25]**

QUESTION 3

What are the uses of thickeners in the metallurgical industry? Define clarification, sedimentation and free-settling behaviour.   **[20]**

QUESTION 4

Draw a generic (not metal specific) typical labelled flowsheet for the recovery of a pure metal from a mineral contained in a mined ore and explain briefly (not more than two sentences) the purpose of each unit. N.B. Your flowsheet will contain compulsory milling, flotation, and leaching units. **[30]**

Good luck