PROGRAM	NATIONAL DIPLOMA *ENGINEERING METALLURGY*
SUBJECT	**PHYSICAL METALLURGY III**
CODE	**PMY 33-3**
DATE	SUPPLEMENTARY EXAMINATION
DURATION	3 HOURS
WEIGHT	40 : 60
TOTAL MARKS	100

ASSESSOR	MR LG JUGANAN
MODERATOR	MR SR SEFOKA
NUMBER OF PAGES	3 PAGES

INSTRUCTIONS

- Answer all questions

QUESTION 1   **[10]**

Explain the significance of the diffusivity coefficient and how alloying additions may impact diffusion.

QUESTION 2   **[10]**

Discuss the phenomenon of Polygonization

QUESTION 3   **[10]**

How is it possible to increase strength of an alloy with cold work?

QUESTION 4   **[10]**

Compare and contrast Carbon and Nitrogen interstitials in surface hardening of steels.

QUESTION 5   **[10]**

Draw a TTT diagram showing the effect of a rapid quench and a slow quench for a 0.5% C-steel.

QUESTION 6   **[20]**

Write notes on initial Austenite grain size in steels.

QUESTION 7   **[10]**

Design a heat treatment for age hardening of a hypothetical alloy.

TOTAL = 80