PROGRAM	NATIONAL DIPLOMA *ENGINEERING METALLURGY*
SUBJECT	**PHYSICAL METALLURGY III**
CODE	**PMY 33-3**
DATE	SUMMER EXAMINATION 13 NOVEMBER 2019
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]**

Quote and identify all the terms for Fick's second law.

QUESTION 2 **[10]**

Explain the three stages of Annealing.

QUESTION 3 **[10]**

What is the significance of prior cold work on annealing and how do cold work/anneal cycles aid manufacture.

QUESTION 4 **[10]**

Use equations to explain how carburising of steel components is achieved.

QUESTION 5 **[10]**

Design a heat treatment to produce fine pearlite for a SAE 1050 steel.

QUESTION 6 **[20]**

Give a detailed account of the Austenite to Pearlite transformation as it occurs in steel.

QUESTION 7 **[10]**

Al –Zn – Cu – Mg alloys demonstrate age hardening characteristics, discuss completely.

TOTAL = 80