INTI International University & Colleges

FINAL

Examination Paper

(COVER PAGE)

Session	:	**April 2019**
Programme	:	Diploma In Mechanical Engineering (DMEN)
Course	:	**EGM2166 : Workshop Technology & Workshop Practice**
Date of Examination	:	July 26, 2019 (Friday)
Time	:	8:00 am -10:00 am Reading Time : Nil
Duration	:	2 Hours
Special Instructions	:	

This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Materials permitted : Non-Programmable Calculator

Material provided : Nil

Examiner : **Dennis,Koh Mui Siang**

Moderator : Ir Gerald Victor Richard Joseph

*This paper consists of **4** printed pages, including the cover page.*

DIPLOMA IN MECHANICAL ENGINEEING PROGRAMME (DMEN)
EGM2166: WORKSHOP TECHNOLOGY AND WORKSHOP PRACTICE
FINAL EXAMINATION : APRIL 2019 SESSION

Instructions: This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions. All questions carry equal marks.

Question 1

(a) In a sand casting which produce a casting, sketch a two-part sand mold and label **SIX (6)** of the major components on the diagram. Explain briefly the function of these components.

(20 marks)

(b) Explain briefly the consequences that may arise If a metal is poured too slowly into the mould.

(3 marks)

(c) State how the situation described in part (b) be overcome and its limitations that may lead to.

(2 marks)

Question 2

(a) Describe briefly the procedure of **investment casting** (**shell-casting** type) starting from the production of the master pattern to the removing of the complete casting from the mold.

(12 marks)

(b) Give **FIVE (5) advantages** and **THREE (3) limitations** of investment casting process.

(8 marks)

(c) Explain why a casting may have to subject to various **heat treatments**.

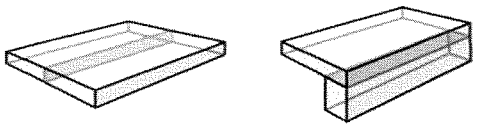
(5 marks)

Question 3

(a) An arc-welding electrode has a designation code of **E7018-C1**.Explain briefly the meaning of the digit codes and numbers based on **American Welding Society designation code**.

(10 marks)

(b) Using some neat sketches to illustrate the types of **fusion welding joints** stated as below:



(i) **Single-Pass Square Groove** butt joint

(3 marks)

(ii) **Single-V Groove** butt joint

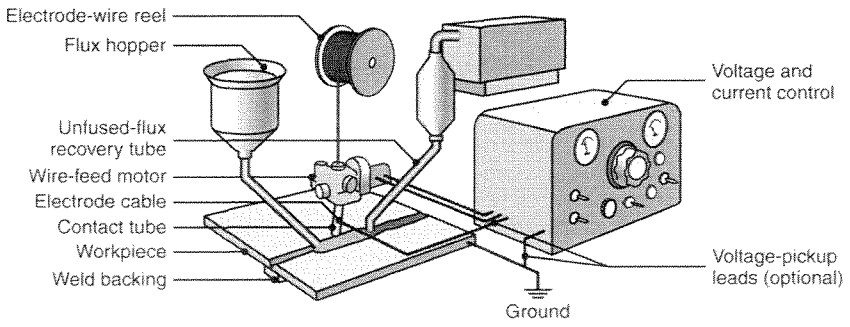
(3 marks)

(iii) **Two-Fillet** corner joint

(3 marks)

(c) Explain in brief why **"submerged arc welding"** generally leads to good quality welding results.

(6 marks)



Question 4

(a) What is **coining**? Give **TWO (2) examples** of products produced by this process.
(10 marks)

(b) List down **FOUR (4) advantages** of the **cold working** in metal forming.
(8 marks)

(c) What are the **TWO (2) features** of metals at elevated temperature that make **hot forming** an attractive technique to alter shape?
(7 marks)

Question 5

(a) Why is the spindle of the lathe hollow and why does the size of this hole become an important dimension to the lathe machine?
(6 marks)

(b) In regards to a **bed-type milling machines**. Explain briefly about the part structures and the operations of the machine.
(12 marks)

(c) Briefly explain the **characteristics** of each **cut of file** below.

(i) **Single**-cut files

(ii) **Double**-cut files

(7 marks)

Question 6

(a) Why is **just-in-time** production required in lean manufacturing?
(8 marks)

(b) In what aspect can **just-in-time** production address drawbacks in manufacturing process?
(4 marks)

(c) **Just-in-time** production also known as a **PULL** system. Give an example of a push system and of a pull system. Indicate the fundamental difference between the two methods.
(13 marks)

-THE END-