INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN :

*Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1
C1

(a) i. Name **THREE (3)** marking tools used in mechanical engineering workshop and list the function of each marking tool.

*Namakan **TIGA (3)** alatan menanda yang digunakan di dalam bengkel kejuruteraan mekanikal dan senaraikan fungsi setiap alatan menanda itu.*

[6 marks]

[*6 markah*]

CLO1
C2

(b) i. Explain the function of micrometer.

Terangkan fungsi mikrometer.

[3 marks]

[*3 markah*]

ii. Explain **TWO (2)** advantages and disadvantages of using a Vernier caliper

*Terangan **DUA (2)** kelebihan dan kelemahan menggunakan angkup Vernier*

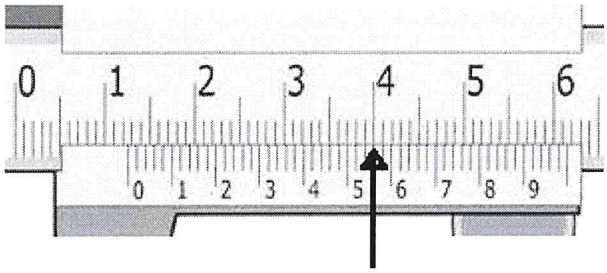
[4 marks]

[*4 markah*]

iii. Based on vernier caliper and micrometer in Figures 1(b), determine the correct reading

Berdasarkan angkup vernier dan micrometer pada Rajah 1 (b), dapatkan bacaan yang betul.

i)



ii)

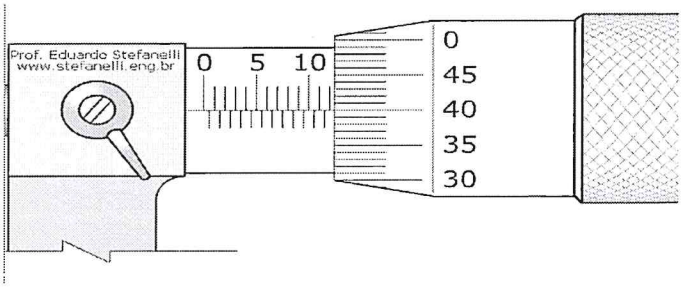


Figure 1(b)

Rajah 1 (b)

[6 marks]

[*6 markah*]

CLO1 C3

(c) Aided with a diagram, identify **FOUR (4)** main parts of twist drill.

*Beserta bantuan gambarajah, kenalpasti **EMPAT (4)** bahagian utama gerudi pintal.*

[6 marks]

[*6 markah*]

QUESTION 2

SOALAN 2

CLO1 C1

(a) Lathe machine is a machine tool that rotates the workpiece on its axis to perform the operation.

Mesin larik adalah alatan mesin yang memutarkan bahan kerja pada paksinya untuk melakukan operasinya.

i. List **FIVE (5)** types of production lathe machine.

*Senaraikan **LIMA (5)** jenis mesin larik pengeluaran.*

[5 marks]

[*5 markah*]

ii. . Name **FIVE (5)** operations that can be performed on lathe machine.

*Namakan **LIMA (5)** operasi yang boleh dilakukan pada mesin larik .*

[5 marks]

[*5 markah*]

CLO1 C2

(b) Explain **SIX (6)** safety procedures while using the milling machine.

*Terangkan **ENAM (6)** langkah-langkah keselamatan semasa menggunakan mesin peraut.*

[9 marks]

[*9 markah*]

CLO1 C3

(c) Calculate the feed rate in mm/min for a twelve-tooth (12 tooth) helical carbide, milling cutter with diameter of 50 mm for machining a cast-iron work piece (CS 33). Use the value of chip per tooth CPT of 0.06.

Hitungkan kadar suapan dalam mm/min bagi pemotongan mata alat peraut heliks duabelas gigi (12 gigi) yang berdiameter 50 mm untuk memotong bahan kerja besi tuang (CS 33). Ambil nilai CPT = 0.06.

[6 marks]

[*6 markah*]

QUESTION 3

SOALAN 3

CLO2 C1 (a). State **FIVE (5)** types of gear.

*Nyatakan **LIMA (5)** jenis gear.*

[5 marks]

[*5 markah*]

CLO2 C2 (b). A spur gear has PD of 40mm and 10 teeth. Calculate:

Sebuah gear mempunyai diameter pitch 40mm dan 10 gigi. Kirakan:

i. Modul (M)

[2 marks]

[*2 markah*]

ii. Addendum (A)

[2 marks]

[*2 markah*]

iii. Dedendum (B)

[2 marks]

[*2 markah*]

iv. Circular pitch (CP)

[2 marks]

[*2 markah*]

CLO2
C3

(c) Based on Figure 3(c), interpret the figure by constructing a CNC program using the following system:
Berdasarkan Rajah 3(c), bina program CNC sebagai interpretasi untuk rajah dengan menggunakan sistem berikut:

i. Absolute coordinate system
Sistem koordinat mutlak

[6 marks]
[*6 markah*]

ii. Incremental coordinate system
Sistem koordinat tokokan

[6 marks]
[*6 markah*]

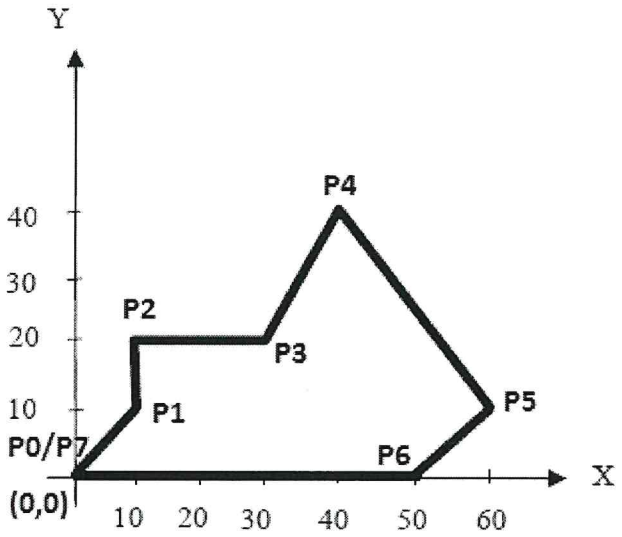


Figure 3(c)
Rajah 3(c)

QUESTION 4

SOALAN 4

CLO2 C1

(a) State and sketch THREE (3) types of basic welding joint.
Nyatakan dan lakar TIGA (3) jenis sambungan asas kimpalan.

[6 marks]
[*6 markah*]

CLO2 C3

(b) Identify the **THREE (3)** effects of shielding gas in welding and **THREE (3)** advantages of Metal Inert Gas (MIG) welding.
*Kenalpasti **TIGA (3)** kesan gas pelindung dalam kimpalan gas dan **TIGA (3)** kelebihan kimpalan Metal Inert Gas (MIG).*

[9 marks]
[*9 markah*]

CLO2 C2

(c) Sketch **FIVE (5)** common defects and relate it with the causes in welding.
*Lakarkan **LIMA (5)** kecacatan umum dan hubungkaitkan dengan penyebabnya dalam kimpalan.*

[10 marks]
[*10 markah*]

SOALAN TAMAT