

SULIT



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI**

JABATAN KEJURUTERAAN MEKANIKAL

PEPERIKSAAN AKHIR

SESI DISEMBER 2015

DJJ1043 : WORKSHOP TECHNOLOGY

TARIKH : 13 APRIL 2016

MASA : 8.30 AM – 10.30 AM (2 JAM)

Kertas ini mengandungi **LAPAN (8)** halaman bercetak.

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Tiada

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

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) Marking tool is an important role in engineering workshop. Name and state the function of following marking tools in Figure 1(a) and list **FIVE (5)** steps of marking out before the drilling process.

*Alatan menanda memainkan peranan penting dalam bengkel kejuruteraan. Namakan dan senaraikan fungsi alatan menanda pada Rajah 1(a) serta senaraikan **LIMA(5)** langkah proses menanda sebelum proses menggerudi.*

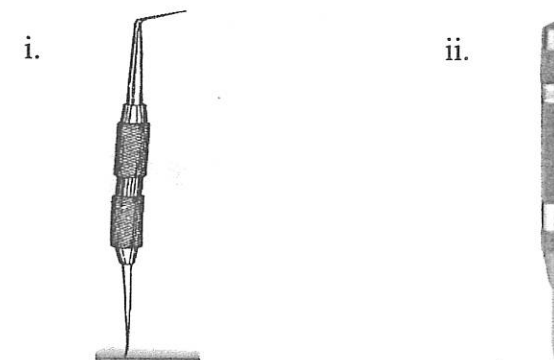


Figure 1(a) / Rajah 1(a)

[11 marks]

[11 markah]

CLO1
C2

- (b) Briefly explain **FOUR (4)** purposes of using cutting fluid in drilling process.

*Jelaskan secara terperinci **EMPAT (4)** tujuan penggunaan cecair pemotong dalam proses menggerudi.*

[8 marks]

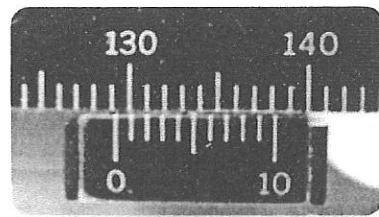
[8 markah]

CLO1
C3

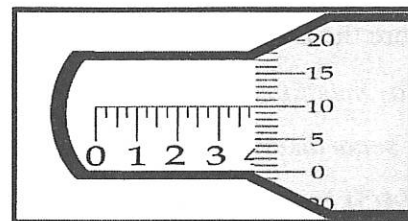
- (c) Based on vernier caliper and micrometer in Figures 1(c), determine the correct reading.

Berdasarkan angkup vernier dan mikrometer pada Rajah 1(c), dapatkan bacaan yang betul.

i.



ii.



Figures 1(c) / Rajah 1(c)

[6 marks]

[6 markah]

QUESTION 2

SOALAN 2

CLO1
C1

- (a) The lathe machine is a machine tool which rotates the workpiece on its axis to perform the operations.

Mesin larik ialah sebuah mesin yang memutarakan bahan kerja pada paksinya untuk melaksanakan operasi.

- i. Draw and label **FIVE (5)** main parts of lathe machine in mechanical workshop.

Lakar dan labelkan LIMA (5) bahagian utama mesin larik yang terdapat di bengkel kejuruteraan.

[5 marks]

[5markah]

- ii. State **TWO (2)** methods to change the spindle speed.

Senaraikan DUA (2) kaedah untuk menukar kelajuan bindu.

[2 marks]

[2markah]

- iii. A knurling tool is used to press a pattern onto a round section as a handle grip. Name **THREE (3)** types of knurling pattern.

Alatan membunga digunakan untuk menekan corak pada bahagian bulat sebagai tempat memegang. Namakan TIGA (3) jenis corak membunga.

[3 marks]

[3 markah]

CLO1
C2

- (b) There are three types of milling machines such as horizontal, vertical and universal milling machines.

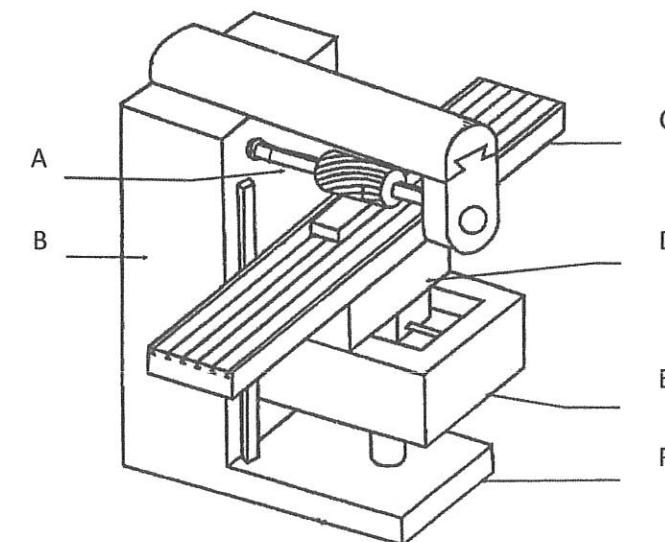
Terdapat tiga jenis mesin peraut seperti mesin peraut mendatar, menegak dan universal.

- i. Name **SIX (6)** main parts of horizontal milling machine in Figure 2(b).

Namakan ENAM (6) bahagian utama mesin peraut mendatar yang diberi pada Rajah 2(b)

[6 marks]

[6 markah]



Figures 2 (b) / Rajah 2 (b)

- ii. Calculate Revolution Per Minute (RPM) that is required to drill 15 mm hole in tool steel (CS 18) using a high speed steel (HSS) drill.
Kirakan pusingan bindu seminit yang diperlukan untuk menebuk 15mm lubang pada bahan keluli menggunakan gerudi keluli (CS 18) berkelajuan tinggi.

[3 marks]

[3 markah]

CLO1
C3

- (c) List **THREE (3)** methods of holding workpiece in milling machine.
Senaraikan TIGA (3) kaedah memegang bahan kerja dalam mesin peraut.

[6 marks]

[6 markah]

QUESTION 3

SOALAN 3

CLO2
C1

- (a) Two identical gears in mesh have a circle diameter (CD) of 120mm. Each gear has 24 teeth. Calculate :
Dua jenis gear bergabung mempunyai diameter bulatan (CP) 120mm. Setiap gear mempunyai 24 gigi. Kirakan :

- i. Pitch diameter
Diameter pitch
- ii. Modul
Modul
- iii. Outside diameter
Diameter luar

[9 marks]

[9 markah]

CLO2
C2

- (b) The program address G which identifies a preparation command is usually called a G-code. Define the G-code as listed below:-

Alamat aturcara G yang mengenal pasti perintah kesediaan dipanggil kod-G.

Nyatakan maksud kod-G di bawah

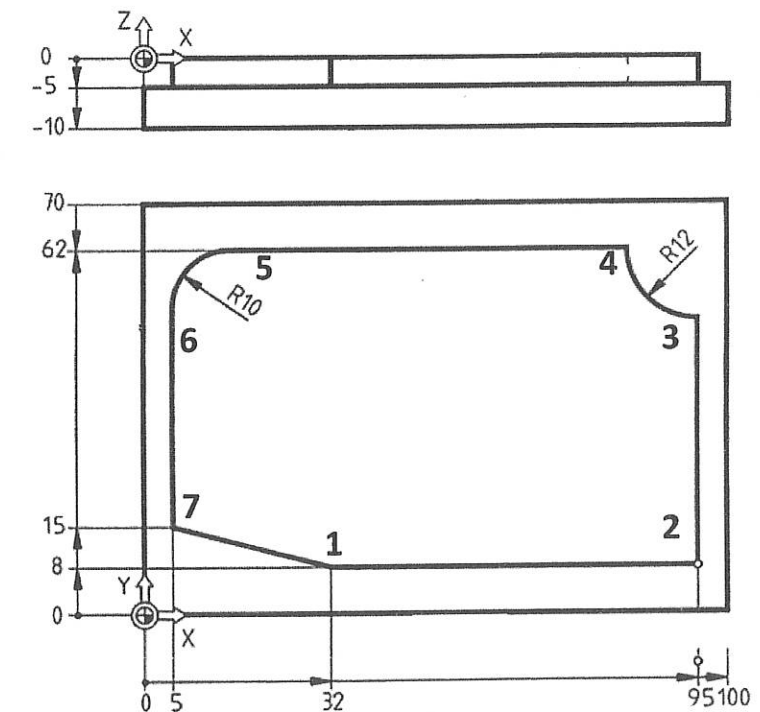
- i. G00
 ii. G01
 iii. G02
 iv. G03

[8 marks]

[8 markah]

CLO2
C2

- (c) Build a G code program to produce the object in Figure 3 (c) below using Computer Numerical Control (CNC). Use absolute coordinate system
Bina satu aturcara G kod untuk menghasilkan objek dalam Rajah 3(c) di bawah menggunakan mesin Kawalan Berangka Berkomputer (CNC). Gunakan system koordinat berpusat



Figures 3 (c) / Rajah 3(c)

Point	G code	X	Y	Z	R
Coordinate system					
Point 1					
Point 2					
Point 3					
Point 4					
Point 5					
Point 6					
Point 7					

[8 marks]

[8 markah]

QUESTION 4

SOALAN 4

CLO2
C1

- (a) i. Name the component labeled with A, B,C,D and E as shown in Figure 4(a)
 Namakan komponen yang dilabelkan A, B,C,D dan E didalam Rajah 4(a) di bawah

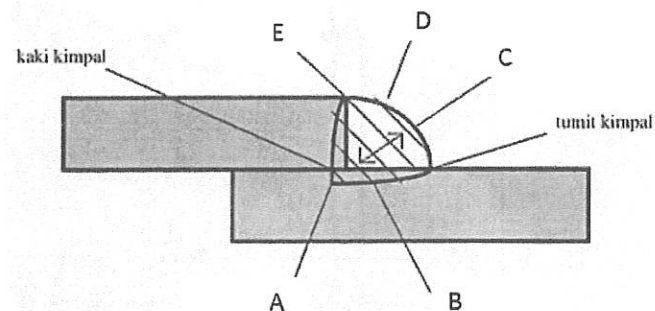


Figure 4 (a) / Rajah 4(a)

[5 marks]

[5 markah]

CLO2
C1

- ii. Draw the diagram of MIG welding equipment. Label the FIVE (5) equipments of them.
 Lukiskan gambarajah peralatan kimpalan MIG. Labelkan LIMA (5) peralatan tersebut.

[10 marks]

[10 markah]

CLO2
C2

- (b) Explain the differences between Gas Metal Arc Welding (GMAW) and Gas Tungsten Arc Welding (GTAW)
 Terangkan perbezaan antara kimpalan logam berperisai gas (GMAW) dan kimpalan tungsten berperisai gas (GTAW)

[5 marks]

[5 markah]

CLO2
C4

- (c) Explain distortion mechanism in welding and how to minimize it.
 Terangkan mekanisma herotan di dalam kimpalan dan bagaimana untuk meminimumkannya.

[5 marks]

[5 markah]

SOALAN TAMAT