

EXAMINATION AND EVALUATION DIVISION
DEPARTMENT OF POLYTECHNIC EDUCATION

(MINISTRY OF HIGHER EDUCATION)

MECHANICAL ENGINEERING DEPARTMENT

FINAL EXAMINATION
JUNE 2012 SESSION

JJ204: WORKSHOP TECHNOLOGY 2

DATE: 24 NOVEMBER 2012 (SATURDAY)

DURATION: 2 HOURS (2.30 PM – 4.30 PM)

This paper consists of SEVEN (7) pages including the front page.

Essay (6 questions – answer 4 questions)

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**DO NOT OPEN THIS QUESTION PAPER UNTIL INSTRUCTED BY THE CHIEF
INVIGILATOR**

(CLO stated at the end of each question is referred to the learning outcome of the topic assessed. The CLO stated is only for lectures reference. Student can ignore the CLO stated)

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JJ204 – WORKSHOP TECHNOLOGY 2

ESSAY (100 marks)

INSTRUCTION:

This section consists of SIX (6) essay questions. Answer FOUR (4) questions.

QUESTION 1

(a) i. List FIVE (5) important elements of screw thread.

- root - thread angle (CLO 1: C1)
- mean diameter - pitch (5 marks)
- major " "
- minor "

ii. Describe FOUR (4) of the elements mention above a) i.

(CLO 1: C2)
(8 marks)

(b) Why is the three-wire method is one of the best methods for measuring the pitch diameter of a V thread.

(CLO 1: C1)
(2 marks)

- kerana dapat mengukur dengan tepat.

(c) With the aid of a labelled diagram, explain briefly how you would use an optical comparator to check the thread angle of 60°.

(CLO 1: C2)
(10 marks)

QUESTION 2

a) State the major function of gear and give **THREE (3)** types of gear that are used in engineering.

(CLO 1: C1)
(5 marks)

b) Sketch and name **FIVE (5)** parts of a spur gear.

(CLO 1: C3)
(8 marks)

c) Two same gear mesh, where the distance between centre diameters is 100mm. Each gear has 20 teeth, Calculate :-

- i. The Pitch Diameter (PD)
- ii. The Module (M)
- iii. The Outside diameter (OD)
- iv. The Whole depth (WD)
- v. The Circular Pitch (CP)
- vi. The Addendum (A)

(CLO 1: C3)
(12 marks)

QUESTION 3

a) Describe the surface texture for engineering equipment.

(CLO 1: C1)
(1 Mark)

b) Sketch a surface texture profile and explain **FOUR (4)** main parts on the texture .

(CLO 1: C3)
(12 marks)

c) Name the symbol for surface texture in **Figure 3(c)**.

6.5 - ketebalan maksimum
1.6 - ketinggian maksimum
0.01 - ketebalan maksimum
0.03 - ketinggian maksimum gelombang
1.6 - ketebalan maksimum gelombang

Figure 3(c)

(CLO 1: C1)
(6 marks)

d) Explain **TWO (2)** types of lay symbol that have been used in surface profile.

(CLO 1: C2)
(6 marks)

QUESTION 4

a) Define Computer Numerical Control.

(CLO 1: C1)

(2 marks)

b) Explain briefly the following basic components of a numerical control system:-

- i. Machine tool
- ii. Control unit
- iii. Programming

(CLO 1: C2)

(9 marks)

c) Numerical control system machine can be done in absolute coordinate (G90) and incremental coordinates (G91).

Differentiate between the two coordinates.

(CLO1:C3)

(6 marks)

d) State the advantages and the disadvantages of the numerical control.

(CLO 1:C1)

(8 marks)

advantage	Disadvantage
- mengurangkan tenaga kerja	- kos terlalu tinggi
- menjimatkan masa	- kos pengeluaran terhad
	-

QUESTION 5

(a) List down **FOUR (4)** characteristics of shielding gas in GMAW welding.

(CLO 1:C1)

(4 marks)

(b) Describe the function of tungsten rod in gas tungsten arc welding process.

(CLO 1:C2)

(3 marks)

(c) Sketch and label main parts of GMAW welding set .

(CLO 1:C3)

(12 marks)

(d) State **THREE (3)** advantages and **THREE (3)** disadvantages of Gas Tungsten Arc Welding

(CLO 1 :C1)

(6 marks)

QUESTION 6

- a) State the function of rapid prototyping in engineering field.
(CLO 1:C1)
(2 marks)
- b) Explain briefly the process of rapid prototyping.
(CLO 1:C2)
(7 marks)
- c) State **THREE (3)** types of additive process in rapid prototyping and choose the base material for each type of rapid prototyping machine.
(CLO 1:C1&C3)
(6 marks)
- d) Sketch and label **FIVE (5)** parts of Selective Laser Sintering (SLS).
(CLO 1:C3)
(7 marks)
- e) State **THREE (3)** advantages of rapid prototyping
(CLO 1:C1)
(3 marks)