UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET	
COURSE CODE	: DTM 1053
COURSE	: WORKSHOP TECH & PRACTICE
SEMESTER/SESSION	: 1 - 2023/2024
DURATION	: 2 HOURS

Instructions:

1. This booklet contains 5 questions. Answer **ALL** questions.
2. All answers should be written in answer booklet.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 4 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

If a student uses equipment, tool and machinery or attempt practical work in a workshop, he/she should know about the safety rules and regulations.

a) **Explain** why the safety in a workshop is very important. (2 marks)

b) **Predict** four (4) of general safety regulations in the workshop. (4 marks)

c) **Predict** four (4) personal safety devices you use in the workshop. (4 marks)

d) **Classify** the four (4) elements of the 5s System. (4 marks)

QUESTION 2

A good machinist should be capable of using all hand tools skillfully. Bench work or hand tool operations include the operation of lying out, fitting and assembling through filing, drilling, grinding, counterboring, countersinking and etc.

a) **Classify** four (4) types of files shape. (4 marks)

b) **Sketch** and **name** three (3) methods of filing technique. (9 marks)

c) **Interpret** difference between countersinking and counterboring. (6 marks)

d) Figure 1 shows the steps to do tapping process. **Explain** the steps from No. 1 – No. 6. (10 marks)

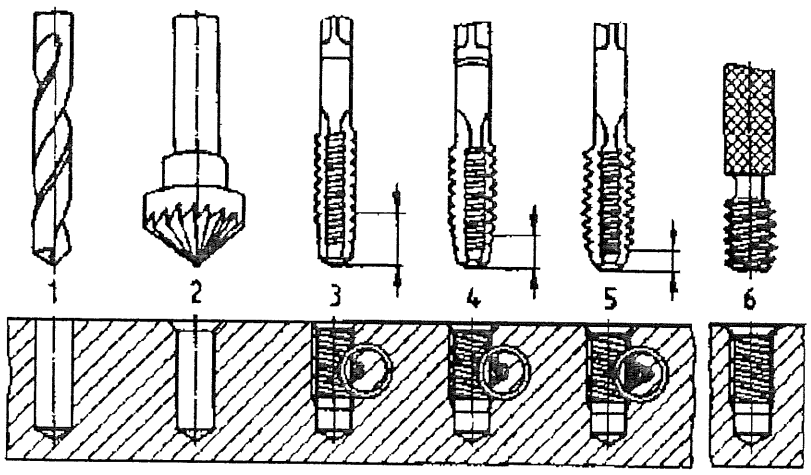

Figure 1: Step to do Hand Tapping

QUESTION 3

One of the most basic machining processes is turning, meaning that the part is rotated while it is being machined. Turning processes typically are carried out on a lathe machine. These machine ade very versatile and capable of producing a wide variety of shapes.

a) **Explain** the definition of turning process. (5 marks)

b) **List** four (4) operations that we can do at turning/lathe machine. (4 marks)

c) **Describe** about:

i. Depth of cut (4 marks)

ii. Feed rate (4 marks)

d) **Interpret** three (3) factors should be considered when selecting cutting speed. (6 marks)

e) A 160mm long, 13.5mm diameter 304 stainless steel rod is being reduced in diameter to 13.0mm by turning on lathe. The spindles rotates at N= 450rpm. **Determine**:

i. Cutting speed (S) at the outer diameter. (3 marks)

ii. Cutting speed (S) at the machined diameter. (3 marks)

QUESTION 4

Milling is one of the most versatile processes in which a rotating cutter removes material while traveling along various axes with respect to the workpiece. Cutting fluids is required during its operation.

a) **Explain** the definition of cutting fluids. (5 marks)

b) **Predict** five (5) purpose of cutting fluids (5 marks)

c) **Classify** four (4) basic shapes of chips produced during machining processes. (4 marks)

QUESTION 5

Computer numerical control (CNC) is a system in which a control microcomputer is an integral part of a machine.

a) **Classify** two (2) types of programming modes in CNC. (2 marks)

b) **Clarify** three (3) advantages of CNC. (3 marks)

c) **Interpret** the meaning of G codes in CNC programming as given below.

i. G01 (1 marks)

ii. G03 (1 marks)

d) Figure 2 show a component to be machined. Using the absolute method, **construct** the position in x- and y- axes of all points. (7 marks)

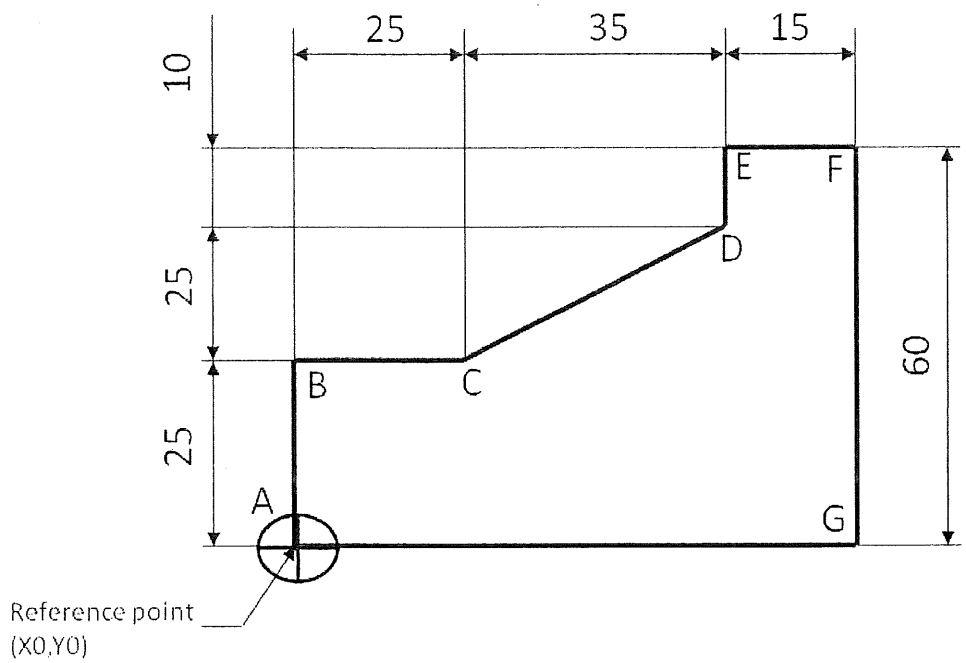

Figure 2: Component to be machined.

----------End of question----------