UNIVERSITY COLLEGE TATI

UNIVERSITY COLLEGE TATI (UCTATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE	: BME 1023
COURSE	: WORKSHOP TECHNOLOGY
SEMESTER/SESSION	: 1-2022/2023
DURATION	: 3 HOURS

Instructions to candidates:

1. This booklet consists of **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, ask the invigilator / Instructor.

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

THIS BOOKLET CONTAINS 4 PRINTED PAGES INCLUDING COVER PAGE

Answer **ALL** questions.

QUESTION 1

5S is about how to organize a work space for efficiency and effectiveness by identifying and storing the items.

a) **Lists** the 5S elements in the workplace. (5 marks)

b) **Illustrate** how the 5S systems will give impact on overall performance to the organization or company. (5 marks)

c) **Identify** six (6) good housekeeping practices that should be used when working in the machine shop. (6 marks)

QUESTION 2

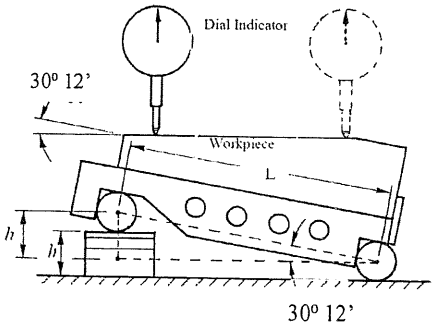

Figure 1 : Sine-bar set-up

You've been requested to inspect a known angle of inclination of the above workpiece, where the specification of the angle is 30° 12'. **Figure 1** shows the sine-bar set-up.

Given:
Sine bar (L) = 200mm
Sin θ = *h*/L

a) **Calculate** the gauge block height (*h*) required to get 30° 12' of angle. (4 marks)

b) **Identify** the purpose of dial indicator as shown in Figure 1. (4 marks)

c) **Break down** an activity shown in Figure 1. (8 marks)

d) **Illustrate** gauging process by using the plug gauge. Sketch show a GO and NOT GO arrangement. (4 marks)

QUESTION 3

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 cross section shape. (4 marks)

b) **Interpret** difference between countersinking and counterboring. (4 marks)

c) **Determine** two important factors in the choice of hacksaw blade. (4 marks)

d) **Elucidate** three (3) advantages of radial drilling machine. (3 marks)

QUESTION 4

a) **Describe** two (2) types of abrasive that usually used to make a grinding wheel. (6 marks)

b) **Calculate** the cutting speed required to turn a workpiece of 30mm in diameter and 250 rpm. (4 marks)

c) **Calculate** RPM (r/min) required to turn a workpiece of 35mm in diameter and with the cutting speed of 25m/min. (4 marks)

Given :

$$V = \frac{\pi \times d \times n}{1000} \quad m/\min$$

Where:

v	=	cutting speed in m/min
d	=	diameter of workpiece in mm
n	=	revolution per minute (rpm)

d) There are several factors required in considering cutting speed. **Explain** four (4) factors in determining cutting speed. (8 marks)

e) **Elucidate** the characteristics used to identify the capacities of a milling machine. (6 marks)

QUESTION 5

a) **Determine** the two (2) angles necessary on a cutting tool for cutting to takes place and sketch your answer. (4 marks)

b) **Distinguish** the following three (3) types of cutting fluid. (6 marks)

1. Soluble oils
2. Synthetic fluids
3. Semi-synthetic fluids

c) **Classify** three (3) most important properties that cutting tools must possess. (6 marks)

d) **Categories** five (5) basic types of wear that affected a cutting tool. (5 marks)

---------- **End of questions** ----------

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Criteria	Marks
All questions answered will be marked according to the answer scheme	/ 100