FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA NIGER STATE
DEPARTMENT OF INDUSTRIAL &TECHNOLOGY EDUCATION
FIRST SEMESTER EXAMINATIONS 2021/2022.

COURSE TITLE: MACHINE TOOL PROCESSESS 1.
COURSE CODE: ITE 571
TIME ALLOWED:2HOURS 45 MINUITES
INSTRUCTIONS: ATTEMPT ONLY FOUR QUESTIONS. NEAT SKETCHES & GOOD EXPRESSIONS WILL BE REWARDED.

QUESTION 1

a. The choice of a selected cutting speed on any machine tool depends on six (6) major factors, identify such factors and discuss each clearly.
b. List clearly seven factors that determine effective turning operation. Discuss critically five (5) of such factors
c. Write detailed notes on each of the following concepts (i)cutting speed (ii) spindle speed (iii) feed (iv) depth of cut (v)cutting tool materials

QUESTION 2

a. Calculate the time, the cutting speed and revolutions required to drill a hole through a mud steel plate of 45mm thick using a 10.5diameter drill the spindle speed is 255 rev/min
b. A cylindrical job of 120mm diameter is to be turned at a cutting speed of 45m/min the feed is 10min/rev. if the length of the Job is 125mm, calculate the following. (i) spindle speed (ii) revolutions (iii)time taken
c. Discuss coolants, the advantages and properties of good lubricants.

QUESTION 3

a. What are the differences between the following taper turning methods on the lathe (i) taper turning with attachments (ii) setting over the fail stock (iii) compound slide method (iv) Taper turning with a straight too
b. Show with the aid of a sketch effect of tool position on tool angles, what is the practical implications on the surface finish of Jobs.

QUESTION 4

Differentiate between a horizontal and vertical milling machine.

a. With the aid of a neat and good sketch, show the principles of dividing head on the milling machine. Label your diagram and explain comprehensively how motions are obtained for gear cutting.
b. Given a Brown and Sharpe indexing plate with the following hole circles 15,16,17,18, 20, 21,23,23,27,29.31,33,37,39,41,43,47and 49 holes. Calculate the indexing for the following (i) 17 (ii) 25 (iii) 36 (iv) 52 (v) 86

QUESTION 5

a. With the aid of a sketch, show a mounted grinding wheel.
Label your sketch and briefly explain the procedure for mounting.
b. Identify five (5) types of "BONDS" used in abrasive wheels and succinctly discuss each
c. Write detailed notes on the following (I) abrasives (II) Bonds (III) Girt and Grades (iv) wheel classification (V) Wheel faults

QUESTION 6

a. Identify and discuss five (5) factors that guide wheel selections
b. What do you understand by the following wheel (i) loading (ii) Glazing (iii) Turning (iv). Dressing (v) Wheel structure
c. Discuss briefly safety precautions that will aid effective grinding operations