

Federal University of Technology Minna
Department of Industrial and Technology Education
First Semester 2022/2023 Session

COURSE TITLE: Machine Tool Processes II

COURSE CODE: ITE 571

TIME ALLOWED: 2Hrs 45Min

INSTRUCTIONS: Attempt only four questions, neat sketches and good logical grammatical expressions will be rewarded

Question 1

1a Discuss cutting fluids in all machine exercises, their roles, classifications and disadvantages

2b Write detail note with clear examples on the following machining concept (i) cutting speed (ii) spindle speed (iii) depth of cut (iv) Feed (v) cutting tool materials

Question 2

2a Identify six major factors that determine selection of cutting speed on any metal production and discuss each critically

2b Explain in detail the concept of feed and elaborately discuss factors that guide feed selection

Question 3

3a with the aid of sketches and clear explanation differentiate between the following taper turning methods (i) taper turning with attachments (ii) setting over the tail stock (iii) compound slide method (iv) taper turning using form tools

3b show with the aid of sketches and short explanation the effect of setting tools, on center, below center and above center

Question 4

4a. with the aid of a good diagrammatic sketch explain the principle of dividing head. Label your sketch and explain how motions are obtained for gear cutting

4b. Given a Brown and sharp with the following hole circles

1st side: 24, 25, 28, 30, 34, 37, 38, 39, 41, 42, 43

2nd side: 46, 47, 49, 51, 53, 54, 57, 58, 59, 62, 66

Calculate indexing for (i) 6 (ii) 13 (iii) 31 (iv) 72 (v) 36

Question 5

5a. A cylindrical job of 120mm diameter is to be turned at a cutting speed of 23m/min, the feed being 3mm/rev. If the length of the job is 150mm find the time required for one cut

5b. Write notes on the following work holding methods (support with sketch where possible) (a) clamping (b) Machine vice (c) Rotary Milling (d) dividing chuck (e) Mounting between centers

Question 6

6a Write short notes on the following

(i) Bond materials (ii) Grit and grade (iii) Wheel structure (iv) Wheel shapes (v) Wheel selection

6b Discuss sequentially factors which influence bond selection