

Unit 4 - Week 2

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

● Lecture 6: Different Types of Tools and MCQ

○ Lecture 7: Mechanism of Chip Formation

○ Lecture 8: Mechanics of Material Removal

○ Lecture 9: Measurement of Cutting Forces

○ Lecture 10: Numerical Problems and MCQ

● Week 2 : Lecture material

○ Quiz : Assignment 2

○ Week 2 Feedback Form

Week 3

Week 4

DOWNLOAD VIDEOS

Assignment Detailed Solution

Live Interactive Session

Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-03-11, 23:59 IST.

1) There is a single point turning tool $0^\circ - 10^\circ - 5^\circ - 5^\circ - 10^\circ - 90^\circ - 0$ (mm) in the ORS system. In this case, the uncut chip thickness would be equal to the 1 point

- Feed applied
- Depth of cut applied
- Chip thickness
- None of these

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

a.

2) A single point turning tool is being used for turning and orthogonal cutting is taking place. The orthogonal rake angle is 4° positive. Assume the following relation between chip reduction coefficient ζ and orthogonal rake γ_o 1 point

$$\zeta = e^{\mu\left(\frac{\pi}{2} - \gamma_o\right)}$$

Where μ is the apparent coefficient of friction at the chip tool interface. Assume it to remain constant at 0.3 even if rake angle is changed. The value of γ_o is expressed in radians in the relation.

Now if the orthogonal rake is increased upto 15° positive (while other parameters are kept unchanged), the chip reduction coefficient will

- Monotonically increase
- Monotonically decrease
- Remain the same
- None of these

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

3) In the cutting of a pipe by a single point turning tool with zero inclination angle and $\phi = 90^\circ$, pure orthogonal cutting is said to be taking place as 1 point

- Chips are not at all produced when a pipe is cut
- There are no chips produced from the auxiliary cutting edge to deviate the chip flowing from main cutting edge
- There are no chips produced from the main cutting edge to deviate the chip flowing from auxiliary cutting edge
- None of these

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

4) In orthogonal turning, 1 point

- The resultant cutting force is always confined in the cutting plane
- The resultant cutting force is always confined in the orthogonal plane
- The force component P_y (transverse force) is always 0
- None of these

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

5) A machine tool dynamometer is 1 point

- The amount of dynamite required to blow up a machine tool
- For measurement of cutting forces
- For measurement of power generated by dynamo driven by machine tool main motor
- None of these

- a.
 b.
 c.
 d.

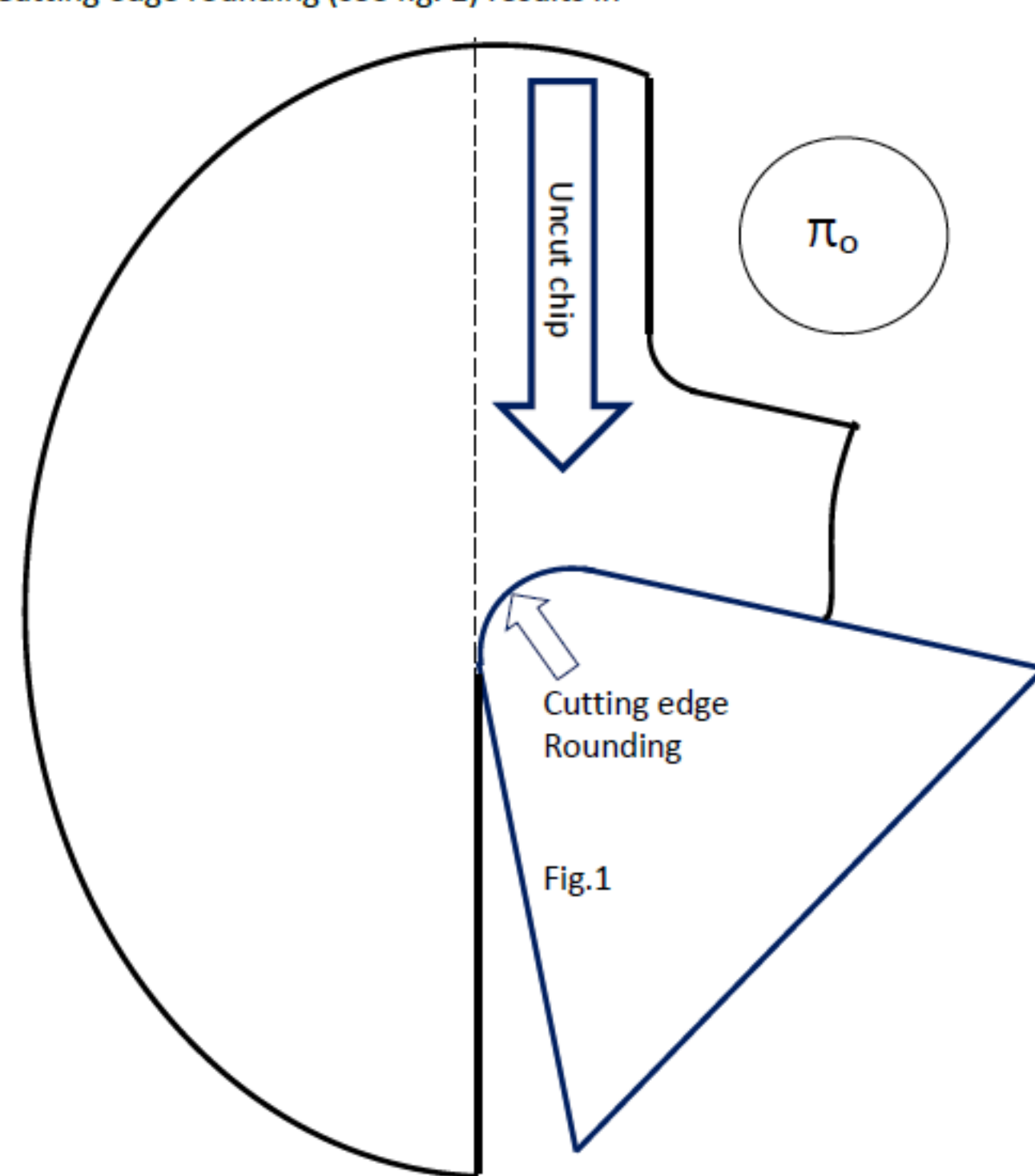
No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

6) Cutting edge rounding (see fig. 1) results in 1 point



- High positive rake angle effect for low uncut chip thickness
- High negative rake angle effect for low uncut chip thickness
- Variation of principal cutting edge angle along tool nose
- None of these

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

7) In a turning operation of a ductile material with a single point turning tool of specification $0^\circ - 5^\circ - 5^\circ - 30^\circ - 65^\circ - 0$ (mm) defined in the ORS (orthogonal rake system), the depth of cut is 2 mm, the chip thickness is 0.35 mm, the uncut chip thickness is 0.2 mm. The value of the yield shear strength of the ductile material = 190 MPa 1 point

The value of the chip reduction coefficient is nearest to

- 5.71
- 10
- 1.75
- Nearest to none of these by ± 0.1

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

8) In the problem 7 - the value of the shear angle is nearest to (in degrees) 1 point

- 20.92
- 30.92
- 50.92
- Nearest to none of these by $\pm 1^\circ$

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

b.

9) If the main cutting force is given by the expression $P_z = t \times s_0 \times \tau_s \times [1 + \cot \beta_0]$, the value of P_z is nearest to (in N) 1 point

- 1056
- 567
- 223
- 154

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.

10) A mild steel cylindrical job is being turned with speed of 100 m/min, depth of cut of 2 mm, feed of 0.18 mm/rev. It is a case of orthogonal cutting. $P_z = 500$ N, $P_x = 300$ N respectively. The orthogonal rake angle γ_o and principal cutting edge angle ϕ are 0 (zero) and 90 degrees respectively. The chip thickness is 0.36 mm. 1 point

Apparent coefficient of friction at the rake face

- 1/5
- 4/5
- 3/5
- 3/4

- a.
 b.
 c.
 d.

No, the answer is incorrect.

Score: 0

Accepted Answers:

c.