

Lab 01

Introduction to machining Processes Lab and Draw Layout of Lab

Lab 02: Introduction to lathe machine perform straight turning and calculate machining time

Number of Passes (N_t)= 1 LC= 0.44 mm Division= 50
 number of lines 22
 Time (t)= 21.99 second -----> 0.3665 min

d=22 t=0.3665
 fr= 60.0273
 f= 0.09095

Sr. No	Length of rod (L) mm	Initial Diameter (Di) mm	Final Diameter (Df) mm	Depth of cut = (Di-Df)/2*N mm	RPMs rev/min	Cutting speed Vi=pi*Di*RPM mm/min	Feed=F= Fr/RPM mm/rev	Fr=F*RPM mm/min	Machining Time= Tm= ((L)/(F*RPM))*N _t Second	Actual Time (Ta) Second	Actual Time (Ta) Minutes	Idle time Ta- Tc min
1	52	25.00	24.00	0.5	660	51836	0.0910	60.03	0.87	22.20	0.37	0.50
2	50	43.10	25.50	8.8	660	89366	0.0910	60.03	0.83	124.80	2.08	1.25
3	49	29.20	23.2	3	660	60545	0.0910	60.03	0.82	26.40	0.44	0.38
4	48.00	36.90	24.15	6.375	660	76510	0.0910	60.03	0.80	49.20	0.82	0.02
5	45.00	35.60	25.50	5.05	660	73815	0.0910	60.03	0.75	58.80	0.98	0.23

Lab 03 Perform taper turning by using compound rest.

Sr. No	Initial Diameter Di mm	Final Diameter Df mm	Length L mm	Change in dia mm	$D_i - D_f / 2 * L$	Tan Inverse in Radian	Tan Inverse in Degree
1	25.8	20.8	30	5	0.08333	0.08314	4.76
2	20.8	16.8	30	4	0.06667	0.06657	3.81
3	16.8	10.8	30	6	0.10000	0.09967	5.71
4	20.8	19	25.8	1.8	0.03488	0.03487	2.00
5	25.4	13.1	38.5	12.3	0.15974	0.15840	9.08
6	18.3	8.3	22	10	0.22727	0.22348	12.80
7	18.65	8.15	21.9	10.5	0.23973	0.23529	13.48
8	25.4	19.1	17.8	6.3	0.17697	0.17515	10.04
9	16.5	12.5	12	4	0.16667	0.16515	9.46

Perform facing operation on MS rod to calculate machining time and material removal rate (MRR)

Actual Timing
Time

Sr No	Diameter (D)	Initial Length (Li)	Final Length (Lf)	Depth of cut (t=Li-Lf)	RPM (N)	Cutting Speed v=pi*D*N	Feed=F=Fr/RPM	Maching Time=(D/(2*F*RPM))*N t	Material Removal Rate = MRR= Pi*D*t*Fr	time t measured (sec)	time t measured (min)
1	37.80	24.50	23.50	1	660	78376	0.018	1.59	2244	66.00	1.10
2	36.80	23.50	22.50	1	660	76303	0.018	1.55	2127	114.00	1.90
3	35.80	22.50	21.50	1	660	74230	0.018	1.51	2013	90.00	1.50
4	34.80	21.50	20.50	1	660	72156	0.018	1.46	1902	132.00	2.20
5	25.60	21.10	20.10	1	660	53080	0.018	1.08	1029	136.80	2.28
6	29.20	23.20	21.20	2	660	60545	0.018	1.23	1339	24.00	0.40
7	36.90	24.15	23.15	1	660	76510	0.018	1.55	2139	48.60	0.81
8	45.60	25.50	24.50	1	660	94549	0.018	1.92	3266	57.00	0.95
9	42.30	22.70	21.20	2	660	87707	0.018	1.78	2811	53.40	0.89

$$Fr = F^* RPM$$

Initial Reading Data

LC of Cross slide lever= 0.05 mm

$$\text{Division} = \frac{100}{100} = 1$$

t=	23.54 second	0.392333333 min
----	--------------	-----------------

LC of long feed lever= 0.04 mm

Compound rest lever= 0.1 mm

Set to 90

1/0.1 depth of cut/least count=Number of lines need to rotate the lever (feed change l

t=	1.5 min
----	---------

Number of lines	of depth of cut	1	20
-----------------	-----------------	---	----

Lab 05 To obtain right hand screw threaded workpiece of given dimensions.

Name: Abubakar Atiq, F2022031002, BSIE

Sr No.	Length of thread screw (mm)	TPI (in)	TPI (mm)	Major Diameter (mm)	Minor Diameter (mm)	Pitch (mm)	
1		45.7	10	254	26.3	24.5	1.8
2		33.5	20	508	26.3	25.5	0.8
3		32.7	16	406.4	26.25	25.1	1.2
4		25.4	1.45	36.83	17.4	15.8	1.6
5		31.8	1.45	36.83	17.4	15.8	1.6

Lab 06:

A) Introduction to drilling machine

B) Perform straight drilling to calculate Material removal rate and Machining Time.

$$\text{Approach Distance, } A = 0.5D \tan \left(90^\circ - \frac{\theta}{2} \right)$$

$$\text{MRR} = \left(\frac{\pi D^2 F_r}{4} \right)$$

$$T_m = \frac{L + A}{F_r}$$

Sr.No	Depth of hole (L) mm	Diameter of drill bit (D) mm	RPMs rev/min	Feed Rate mm/min	MRR mm/min	Machining Time min	Actual Machining Time min	Percentage Difference %
1	25.15	16	660				0.67	
2	25.15	16	660				0.68	
3	25.15	16	660				0.61	
4	25.15	16	660				0.72	
5	25.15	16	660				0.77	

Lab 07	To perform facing operation on shaper machine to calculate machining time.				
	l	w	c	N	f
Sr No.	Length of Workpiece	Width of Workpiece	Clearance Length	No. of Stroke per min	feed (mm/stroke)
	mm	mm	mm		
1	86	30	142	60	0.3
2	123.45	26.4	179.45	60.0	0.3
3	123.25	25.7	179.25	60.0	0.3
4	123.35	26.25	179.35	60.0	0.3
5	123.15	26.2	179.15	60.0	0.3
6	123.05	26.1	179.05	60.0	0.3
Clearance (c)=	28 mm				
Shaper Machine Lever Position indication					
1=	20 stroke/min				
2=	40 stroke/min				
3=	60 stroke/min				
m=(returning stroke time/forward stroke time)=			0.666666667		

[illegible]

Objective:

Introduction to Milling Machine and perform face milling to calculate Machining time.

NO OBSERVATION NEEDED FOR THIS LAB 08

Lab 09 Introduction to milling machine and perform face milling to calculate the machining time.

24-12-2024 Mohammad Abubakar Atiq, F2022031002,BSIE

length of workpiece (L)	=	95 mm	LC=0.05mm, depth=1mm
Width of workpiece (w)	=	50 mm	La=2mm, Lo=2mm
Number of teeths (n _t)	=	4 mm	HSS(High Speed Steel)
Diameter of tool (D)	=	8 mm	
Approach and Overtravel length (Lc)=La+Lo	=	4 mm	

Sr. No	RPM (N) rev/min	Cutting Speed Vc=pi*D*N mm/min	Feed f mm/rev	Feed rate fr=f*nt*N mm/min	Theoretical Machining time Ttheo=(L+Lc)/fr min	Actual machining time Tactual second	Actual machining time Tactual min	Percentage Difference (Ttheo-Tact)/(Tact)*100% min
1	450	11309.73355	8	14400	0.00375	39	0.65	99.42%
2	450	11309.73355	8	14400	0.00375	22	0.366666667	98.98%
3	450	11309.73355	8	14400	0.00375	29	0.483333333	99.22%

Comment:

Error Due to Manual feed as compared to Automated feed.

We took, L=W for Ttheo, Why because, L is that length we did machining in this case, we will take L=W, 50mm.

Feed is the diameter of the tool in this case.

Lab 10:

To perform hexagon on circular rod by using plain indexing.

Number of faces = _____

Circular hole plate = _____

Number of holes after complete rotation = _____

NO OBSERVATION TABLE PROVIDED AS PER NOW.