College of Technological Studies Production Technology (MEP232)

Dept. of Mech. Prod. Tech. Exercise Sheet for Milling Operations

Milling Sheet: Model (1)

Student Name: Problem Cutter Workpiece **Operation & Cutting Conditions** Coated Carbide Inserts. • Hard Steel with • Type: Four Slots using single Alloy • (600×500×200) Dimension cutter. Cutter Diameter (Dc)=100 • mm. • Cutting Speed (Vc): 50 mm. Teeth (inserts) Number (Z) = Removed thickness (h) = 13m/min. • • • Feed (fr) = 1.5 mm/rev. 20. mm. • Specific Energy (Ks):2000 Cutter width (b) = 50 mm. • kp/cm2

1 - Model(1) Name:

Milling Sheet: Model (2)

Student Name:

Problem • Cutter • **Conditions** • Hard Alloy Steel • 20 slots on a cylindrical rod. Coated Carbide Inserts • • Removed thickness (h) = 13 • Cutting Speed (Vc): Cutter Diameter (Dc)=150 50 • m/min. mm. mm. • Teeth (inserts) Number (Z) = • Specific Energy (Ks):2000 • Feed = 0.2 mm/tooth 30. kp/cm2 Cutter width (b) = 10 mm.•

Milling Sheet: Model (3)

Student Name:

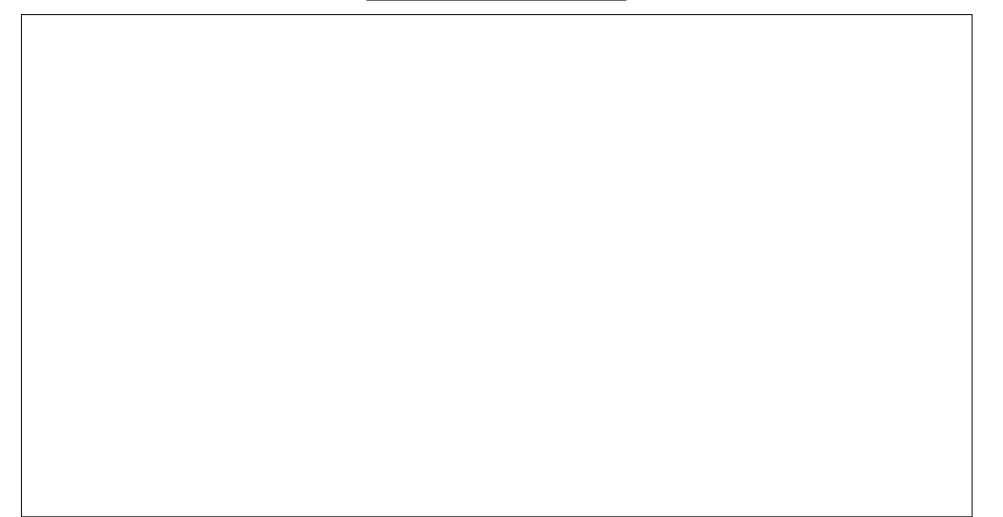
<u>Problem</u>					
Cutter	•	•			
		Conditions			
 Coated Carbide Inserts 	Hard Alloy Steel	• 3 slots using gang milling.			
(lovejoy)	• Removed thickness (h) = 13	Cutting Speed (Vc): 50			
Cutter Diameter (Dc)=150	mm.	m/min.			
mm.	• Specific Energy (Ks):2000	• Feed = 25 mm/min.			
• Teeth (inserts) Number (Z) =	kp/cm2				
30.					
• Cutter width (b) = 30 mm.					

Milling Sheet: Model (4)

Student Name:

Problem					
Cutter	•	•			
		Conditions			
Coated Carbide Inserts	Hard Alloy Steel with	 Type: Slab milling 			
(lovejoy)	dimension (600×300×200)	Cutting Speed (Vc): 50			
Cutter Diameter (Dc)=100	mm.	m/min.			
mm.	• Removed thickness (h) = 13	• Feed = 0.12 mm/tooth.			
• Teeth (inserts) Number (Z) =	mm.				
20.	• Specific Energy (Ks):2000				
• Cutter width (b) = 40 mm.	kp/cm2				

Part (A) Operation Sketch



Part (B) Machining Time

Rough Machining Time (Tr) =

Finish machining Time (Tf)=

Machining Time (T) =

Total Machining Time (Ttot) =

Part (C) Cutting Forces and Power

Main Cutting Force Ft =

$$Ac = \phi s =$$

Total Main Cutting Force = $Ft \times Zs$ =

$$Zs =$$

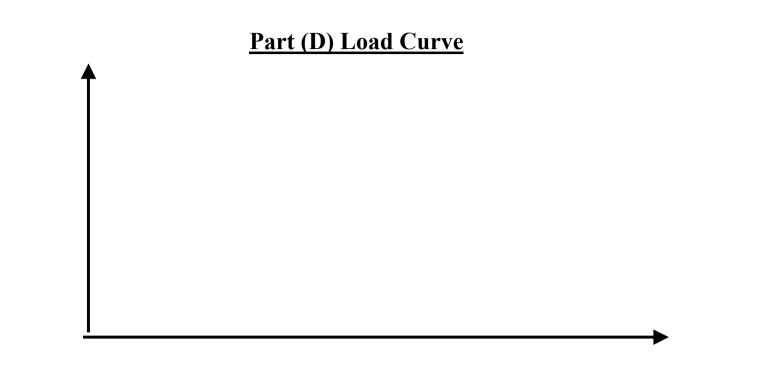
Radial Force Component (Fr) =

Axial Force Component (Fa)=

Consumed Motor Power (P) = Total Ft

× Cutting Speed (Vc)

=	×		=	kw
Arbor Torque (Mt) = Total Ft	×	Dc/2		
=	×		=	kp.m



Surface signature			
Recommendation	Z=	Dc=	Dr=