Mansoura University
Faculty of Engineering
Prod.Eng. & Mech. Design Dept.
First Year

Machining Tech. & Equipment (I)
Final Exam
Date: 1/6/2014
Time : 3 hours

Answer the Following Questions

Question (1) **(15 marks)**

1) Discuss briefly the more common general health and safety precautions in machining workshops?
2) Compare between the hack sawing machine and band sawing machine.
3) Illustrate the geometry of the single point tool and define its important features and angles.

Question (2) **(20 marks)**

1) Illustrate with net sketches the different lathe operations.
2) Define in details the different types of chip formation; illustrate your answer with net sketches.
3) Define the tool material properties and state the different types of tool materials.
4) What are the rules for longitudinal turning?

Question (3) **(20 marks)**

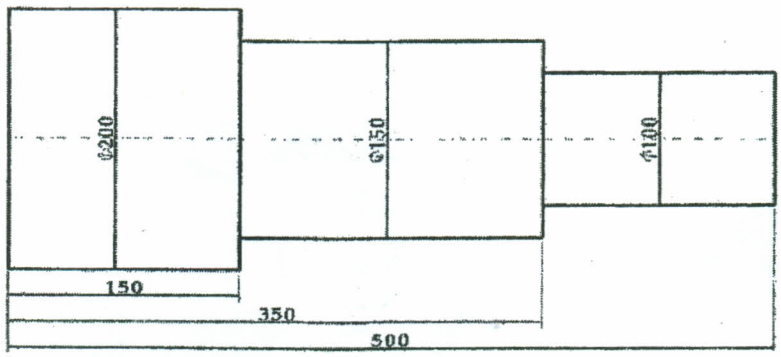
1) Using neat sketches illustrate and describe the twist drill geometry.
2) The cutting speed cannot be chosen at random; so, if it is too low, or too high, what do you expect to be happened?.
3) Define the special drilling and boring tools.
4) In detail, compare between shaping machine (shaper) and planning machine (planer).

Question (4) **(15 marks)**

1) Compare between conventional and climb (up & down) milling using neat sketch.
2) Define the angles and tooth pitch for machining of various materials, in case of milling.
3) State the reason of the following cutters are 'used :
   1. Plain milling cutter. 2. T -slot cutters. 3. Shell end mills.
   4. Staggered milling cutters. 5. Angle milling cutters.

Question (5) **(20 marks)**

For the part shown, calculate the machining time from a stock made of steel 4212, raw material dimensions D=210mm, L= 510 mm. For roughing N = 90 r.p.m, depth of cut a= 1.5 mm, and feed F = 0.8 mm/rev. For finishing N = 120 r.p.m, depth of cut a = 0.5mm, and feed f = 0.2 mm/rev.



Wishing the best of luck for all of you
Prof.Dr. Tawfik Tawfik El-Midany