Menoufiya University Faculty of Engineering Shebin El- Kom Second Term – Final Exam Academic Year: 2014-2015 Date: 16 / 06 / 2015		Department: Mech. Power Eng. Year : First Subject: Production Engineering Code : PRE 128 Time Allowed: Three Hours Total Marks : 60 Marks
Allowed Tables and Charts: None		

Answer all the following Questions:

Question Own: **{ 19 Marks }**

a- What are the cutting tool characteristics? **(2 Marks)**

b- Illustrate by sketches the methods used for turning the tapered parts. **(4 Marks)**

c- A new lathe tool is to be used on cast iron work with a 150 mm diameter to make a 125 mm long rough cut in 3 passes. The operation conditions listed below were provided by the supplier or assumed. Cutting Speed = 90 m/min, Feed Rate = 0.2 mm/rev, Depth of Cut = 3.125 mm

- Calculate the parameters: **(3 Marks)**

a) Spindle RPM b) Time to make the cut (min.) c) Metal Removal Rate.

d- 21- Calculate the suitable gear train when cutting the following threads on the lathe machine: **(5 Marks)**

i- 3 mm pitch on 6 mm lead screw
ii- 13 tpi on a 4 tpi lead screw
iii- 6 threads in 12 mm on 6 mm lead screw
iv- 2.5 mm pitch on 6 tpi lead screw
v- 10 tpi on a lathe having 6 mm pitch lead screw

e- Illustrate by sketches the drilling operations. **(2 Marks)**

f- In a drilling operation using a twist drill, the rotational frequency is 5/second, the feed rate is 0.25 mm/rev, and the drill diameter is 12 mm. **(3 Marks)**

Calculate:-

- **The volumetric removal rate.**
- **The machining time if the workpiece thickness is 25 mm.**

Question Two: **{ 19 Marks }**

a- List the differences between the shaper and planer machines. **(4 Mark)**

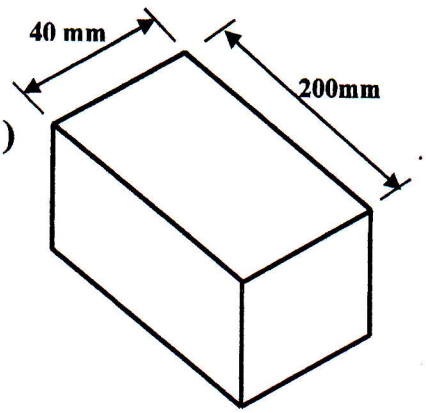
b- A shaper is operated at 120 cutting strokes / min and is used to machine a workpiece of 150 mm in length and width 100 mm at a feed of 0.4 mm / stroke and depth of cut 6 mm. **(4 Marks)**

Calculate:

i) The cutting speed.
ii) The total machining time to produce 100 component if QRR = 0.5.
iii) The material removal rate.

c- We wish to face mill the top of a block of aluminum as shown, at a cutting depth of 2.5 mm. We will use a 50 mm wide face mill with 5 cutting inserts. From a handbook:
– Feed f = 0.25 (mm/tooth)
- The cutting speed V = 20 m/min
Calculate:-
a-The machining time.
b- Metal removal rate.

(4 Marks)



d- Calculate the index head movement and the gear ratio required to index 271 divisions.

Where: **Plate I: (15, 16, 17, 18, 19, 20), Plate II :(21, 23, 27, 29, 31, 33) and Plate III :(37, 39, 41, 43,47,49) holes.** **(4 Marks)**

e- List the factors to be considered in the selection of the proper G.W. **(3 Marks)**

Question Three: **{ 5 Marks }**

a- What are the advantages and disadvantages of cold working? **(3 Marks)**

b- How can the forging processes are classified? **(2 Marks)**

Question Four: **{ 17 Marks }**

a- Illustrate by sketches the arrangement of rollers for rolling mills. **(5 Marks)**

b- Describe the tube rolling process. **(4 Marks)**

c- Illustrate by a neat sketch the defects in extrusion. **(2 Marks)**

d- What are the methods of reducing or eliminating spring back in bending process? **(3 Marks)**

e- Illustrate by sketches only the various methods for tube bending. **(3 Marks)**

With our best wishes
Dr. Ali Elmasry

This exam contributes by measuring in achieving Program me Academic Standards according to NARS								
Question Number	Q1-a, Q3-a, Q4-d	Q1(b-e),Q2-a, Q4(a-c-e)	Q4-b	Q3-b		Q1(c-d-f), Q2(b-c-d)	Q2-e	
	a3-1	a8-1	a19-1	b14-1		c5-1	c8-1	
Skills	Knowledge & Understanding Skills			Intellectual Skills		Professional Skills		