

Menoufiya University
 Faculty of Engineering
 Shebin El- Kom
 Second Term – Final Exam
 Academic Year: 2018-2019
 Date: 13 / 06 / 2019



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

♣ Exam in two pages ♣

Answer all the following questions (with the help of net sketches), (Assume any missing data):

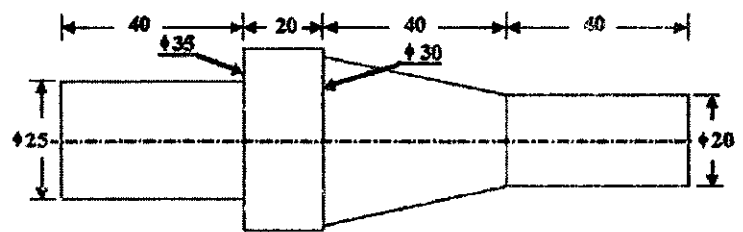
Question One:

{15 Marks}

a- Illustrate by sketches the methods used for turning the tapered parts. [b14-1] (3 Marks)

b- Find the machining time to finish the job as shown in the figure from 40 mm initial diameter, assuming that:

- For turning: $V = 35 \text{ m / min}$,
 $f = 0.4 \text{ mm / rev}$
- Depth of cut = 1.5 mm
- For drilling: $V = 30 \text{ m / min}$,
 $f = 0.15 \text{ mm / rev}$



[c5-1] (5 Marks)

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c- Calculate suitable gear trains for the following cases:

- 1- 2.5 mm pitch on a 6 mm lead screw
- 2- 11 tpi on a 4 tpi lead screw
- 3- 7 threads in 10 mm on 6 mm lead screw
- 4- 7/22 in. pitch, 3 starts on a lathe with 2 tpi
- 5- 2.5 mm pitch on a 4 tpi lead screw
- 6- 12 tpi on a lathe having 6 mm pitch lead screw

[c5-1] (4 Marks)

d- List the boring machines types.

[a19-1] (1 Mark)

e- Calculate the metal removal rate and machining time when drilling a blind hole of 16 mm diameter hole and 45 mm depth using 20 m/min cutting speed and feed rate of 0.25 mm/rev.

[c5-1] (2 Marks)

Question Two:

{15 Marks}

a- List the differences between the shaper and planer machines.

[a19-1] (2 Marks)

b- Calculate the shaping time for a workpiece length 600 mm and width 150 mm using a feed rate of 0.5 mm/stroke. The height of the part was 60 mm which was reduced to 50 mm at a maximum depth of 2 mm; the cutting speed was 30 m/min and $V_c: V_r$ was 1:2.

[c5-1] (3 Marks)

c- Illustrate by a sketch the standard milling machine arbor installation. [c8-1] (2 Marks)

d- In horizontal milling of mild steel workpiece having the following conditions:

- Cutting speed = 60 m/min, Feed rate = 360 mm/min.
- Depth of cut = 3.2 mm, D = 144 mm, B = 40 mm

Calculate;

i- Machining time for one travel if the workpiece length = 360 mm.

ii- Metal removal rate.

[c5-1] (3Marks)

e- Calculate the indexing and change gears required for 53 divisions. The change gears supplied with the dividing head are as follows:

20, 24, 28, 32, 40, 44, 48, 52, 64, 72, 86

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.

[b14-1] (2Marks)

f- Explain with the aid of sketches the grinding operations.

[a3-1] (3Marks)

Question Three:

{16 Marks}

1-Differentiate between cold and hot working of metals. Mention two advantages and disadvantages of each of these techniques

[a19-1] (4Marks)

2- What is forging? Classify the different methods of forging.

[a19-1] (3Marks)

3- Describe two types of forging machines

[c5-1] (3Marks)

4- Compare briefly, with neat sketches, the different rolling mill arrangement

[c5-1] (3Marks)

5- Describe, with sketches, the basic types of extrusion

[c5-1] (3Marks)

Question Four:

{14 Marks}

1- Give an explanation of the following terms:

*Blooms *Billet *Slab *Sheet *Plate *Strip [a19-1] (3Marks)

2- With free and sketch, what are the main defects in deep drawing [a19-1] (3Marks)

3- Write short notes, with sketches, for: [a19-1] (8 Marks)

*Blanking and piercing *Wire drawing *Deep Drawing

*Bottom bending * Roll bending *Friction in metal forming

With our best wishes

Prof. Dr. Mohamed El-Aziz

Dr. Ali Abd Elhawy Elmansry

This exam contributes by measuring in achieving Program me Academic Standards according to NARS						
Question Number	Q2-f		Q1-d, Q2-a Q3-(1,2), Q4-(1,2,3)	Q1-a, Q2-e	Q1- (b,c,e), Q2-(b,d), Q3-(3,4,5)	Q2-c
Skills	a3-1	a8-1	a19-1	b14-1	c5-1	c8-1
	Knowledge & Understanding Skills			Intellectual Skills	Professional Skills	