


Menofiya University Faculty of Engineering Tim Allowed: 3 hours Post- Graduate Exam, 2013-2014 Date of Exam: 14/ 6 /2014		Production Diploma (500 Level) Subject : Forming technology Code: PRE 507 Total Mark: 100 Marks Production Eng. Dep.
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**Answer all the following questions**

**Neat sketches are absolutely necessary.**

**Be precise and scientific in writing.**

**QUESTION NO. 1**

**(20 Mark)**

Connecting rods can be made either by forging or by powder technology. Discuss in details the materials as well as the MFG processes that you would recommend for making connecting rods in quantities of, 1000. Then explain whether they would need additional-operations. If no, make recommendations and give the reasons for them.

**QUESTION NO. 2**

**(30 Mark)**

Severe plastic deformation (SPD) processes are defined as metal forming technology in which a very large plastic strains is imposed on a bulk process in order to make light weigh parts by using high strength materials. Describe in details the following items:

- SPD processes,
- Properties of metals processed by SPD,
- Combined processed with SPD. and
- SPD applications.

**QUESTION NO. 3**

**(20 Mark)**

3D Nanofibrous structures made of inorganic compounds or composites have potential applications in energy harvesting and storing. Comment with particular emphasis on dye sensitized solar cells.

**QUESTION NO. 4**

**(30 Mark)**

A) A cylindrical specimen made of annealed 4135 steel 50 mm in diameter and 100 mm high. It is upset by open-die forging with flat dies to a high of 50 mm at room temperature. Assume the coefficient of friction is 0.2. calculate the force required at the end of the stroke. if the flow stress of 4135 steel is 1100 MPa.

B) What are the advantages and limitations of :

- Isothermal forging
- Orbit forging
- Incremental forging

C) In rolling of a flat strip, list and explain the followings:

- The conditions under which the neutral points is shifted towards the entry zone.
- The methods used to reduce the roll separating force.

\*\*\*\*\* GOOD LUCK\*\*\*\*\*

Question number	Q1	Q2	Q2	Q3	Q2	Q2	Q3	Q4	Q2	Q3	Q4	Q4
Skills	a-1- 1	a-2- 2	a-3- 1	a-4- 1	b-1- 1	b-2- 4	b-4- 1	b-4- 3	c-1- 1	c-2- 2	c-4- 3	c-4- 4
	Knowledge& understanding skills				Intellectual skills				Professional Skills			