

Menofia University
Faculty of Engineering
Production Eng. & Mechanical Design Dept.
Post-Graduate Exam. , Production Diploma-Level 500
Forming Technology *Time : 3 hrs.* *Date : 18 / 1 / 2014*
(100 Marks)

Neat sketches are absolutely necessary :

Be precise and scientific in writing .

Describe briefly (but clearly) the following manufacturing techniques .

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| 1) Vibration Assisted Forming . | 10P |
| 2) Electrohydraulic Forming of Near Net shape Automotive Panels. | 15P |
| 3) Superplastic Forming Combined with Diffusion Bonding for Manufacturing Honeycomb structure. | 10P |
| 4) Severe Plastic Deformation (ECAP,HPT,ARB) . | 15P |
| 5) Die Design ,Die Materials and Die Failure in Forging operations. | 15P |
| 6) In rolling of a flat strip , How will the following Parameters changes affect the neutral angle?
- Increase in friction ,
- Increase in reduction ,
- Increase in roll diameter. | 15P |
| 7) Hot Rolling of sheet plate , final thickness of the plate 4mm , reduction in thickness 40% , roll diameter 500mm.
Determine:-
a) Location of α_n and roll pressure at this point.
b) Roll pressure when $\alpha = 1^\circ$ and $\alpha = 3^\circ$, Express the roll pressure in terms of $p/\bar{\sigma}$ $M = 0.6$ assume Zero front and back tension. | 20P |