

**BACHELOR OF METAL ENGG. FINAL EXAMINATION, 2009**  
(4th Year, 1st Semester)

**METAL WORKING PROCESS**

Time : Three hours

Full Marks : 100

Answer any **five** questions.

1. State the yield criteria and its importance in metal working. Which criteria is more often used in design and explain why ? "Metal working theory begins exactly where structural theory ends" — Explain. State the general characteristics of any manufacturing process and mention the key to the successful metal working. 10+10
2. How do you classify the metal working process ? Give example in each case. Discuss the various factors that influence the working process. 10+10
3. Describe with neat sketches the classification of rolling mill. State their advantages, limitations and applications. 20
4. a) Considering both the upper and lower rolls do work against the roll separating force, find out the total work done in one minute and the total amount of electricity concerned.  
b) How rolling load is affected by the initial thickness of the stock and speed ?

[ TURN OVER ]

( 2 )

- c) Why is it not possible to reduce thickness of a strip below a certain limit ? 8+6+6
5. a) What do you mean by 'Fibre Structure' ? Explain with example the usefulness of such structure in forged m/c parts.
- b) Discuss in brief the different types of equipments used in forging stating their advantages, limitations and applications.
- c) How forgeability can be improved ? 4+12+4
6. Justify the following statements : 5×4=20
- a) It is necessary to design the 'flash' with proper dimensions:
- b) Both under and over draught are important in rolling mill.
- c) Like area, the shape of the pressure distribution curve is very important in rolling.
- d) Amount of deformation in extrusion process is usually represented by 'Extrusion Ratio' not by 'reduction in area'.
- e) The orange peel effect occurs in steel of relatively large grain size.
7. a) Discuss the different types of extrusion process and their merits and demerits. How do the various factors influence the force required to cause extrusion?

( 3 )

- b) What do you mean by 'Redundant Work' ? Discuss the deformation behaviour in extrusion process and role of redundant work. 12+8
8. Write short notes on (any four) : 5×4=20
- a) Manufacture of Seamless pipes and tubes
- b) Variables in wire Drawing
- c) Roll Pass Design
- d) Deep Drawability and limiting draw ratio.
- e) Rolling Defects.

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