4. Find out the extrusion pressure under ideal condition. Why is it necessary to express the amount of deformation by 'extrusion ratio' not by % reduction? Discuss the variables in extrucsion determining the extrusion pressure. 5+3+12

5. a) Describe the following forging processes and their applications:

   i) Stamping in horizontal forging m/c

   ii) Knural Roll forging

   iii) Transverse spiral roll forging

   b) How forgeability is being evaluated and how it can be improved? 15+5

6. a) What is redundant work? How can it be minimized?

   b) Discuss the different techniques used in minimizing extrusion defects.

   c) How one can produce seamless tube without mandrel? 6+8+6

7. How do you classify sheel metal forming? Discuss in short four import forming methods and their merits & demerits. State the probable defects that may arise in such formed parts. 2+15+3

8. Write Short notes on (any four) : 4×5 = 20

   a) Rolling defects

   b) Rotary swaging m/c

   c) The Planetary mill

   d) Wire drawing

   e) Thermal spraying

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BACHELOR OF METALURGICAL ENGG EXAMINATION, 2010

(4 th Year, 1st Semester)

METAL WORKING PROCESS

Time : Three hours. Full Marks : 100

Answer any **five** questions

1. What are the index used to describe the severity of plastic deformation in forging? State their drawbacks and give more useful index of principal deformation. Discuss the variables that influence the ability of metals to flow during forging. Important dimensions in the flash region of a die are the saddle width and flash thickness - Explain. 2+3+12+3

2. Find out the improved cold rolling loads from normal pressure calculation. High purity aluminium strip 1500 m wide is cold rolled from 4 mm to 3.3 mm thickness on a four-high mill with 500 mm diameter work rolls. Mean plain strain flow stress of the material is 143.85N/mm^2. Determine the improved value of the rolling load if μ= 0.06 10+10

3. Calculate the total amount of electricity consumed in making a particular reduction from rolling.

   A coil of brass, 35 m long and 0.7 m wide, is produced after a reduction from 5 mm down to 4mm in a single pass on a two high rolling mill under constant load conditions. The steel roll diameters are 0.6 m and rotates at 30 r.p.m. If the constant load is 600 tonne, determine the horse power developed and the energy consumed. [Assume any missing data] 10+10