Fifth Semester B.E. Degree Examination, June/July 2017
Manufacturing Process - III

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions, selecting atleast TWO questions from each part.*

PART – A

1   a. With neat sketches, explain the classification of metal working processes on the basis of force applied.   **(10 Marks)**
    b. With a neat sketch, explain true stress and true strain.   **(05 Marks)**
    c. Write a brief note on Wrought Products.   **(05 Marks)**

2   a. Briefly explain the effect of Temperature, Friction and Lubrication in metal working process.   **(10 Marks)**
    b. With a neat sketch, explain the hydrostatic pressure in metal working.   **(10 Marks)**

3   a. Derive the expression for forging pressure and load in open die forging by slab analysis making suitable assumptions.   **(10 Marks)**
    b. Explain die design parameters in forging.   **(05 Marks)**
    c. Explain typical defects in forged components.   **(05 Marks)**

4   a. With a neat sketch, explain planetary rolling mill.   **(05 Marks)**
    b. Describe the effect of front and back tension on the rolling load.   **(05 Marks)**
    c. Calculate the rolling load if a steel is hot rolled from a 40mm thick slab of width 760mm. The reduction in thickness achieved is 30% and the roll diameter is 900mm. The plane strain flow stress is 140 MPa at the entrance and 200 MPa at the exit from the roll gap because of the increasing velocity. Assume the co-efficient of friction as 0.3. If the roll speed is 100 rpm, what is power required to drive the rolls?   **(10 Marks)**

PART – B

5   a. Explain Optimal cone angle and Dead zone formation in drawing.   **(06 Marks)**
    b. Write a note on estimation of redundant work in drawing.   **(06 Marks)**
    c. A steel wire is drawn from an initial diameter of 12.5mm to a final diameter of 10mm at the speed of 120m/min. The half cone angle of the die is 6^0 and the coefficient of friction at the die – wire interfaces is 0.12. A tensile test on the steel specimen has shown a yield stress of 210N/mm^2. Determine the draw force and the power required, assuming that there is no back tension applied.   **(08 Marks)**

6   a. Give the classification of extrusion processes and explain forward extrusion process with a neat sketch.   **(08 Marks)**
    b. Write a note on extrusion equipment and die design.   **(04 Marks)**
    c. Explain the manufacture of seamless tubes, with neat sketch.   **(08 Marks)**

7   a. Explain the various operations performed on sheet metal component.   **(10 Marks)**
    b. With neat sketch, explain the following dies : i) Progressive dies   ii) Compound dies.   **(10 Marks)**

8   a. With a flow chart, explain the operations involved in making powder metallurgy parts.   **(10 Marks)**
    b. Explain the principles of High energy rate forming.   **(04 Marks)**
    c. With a neat sketch, explain the explosive forming process.   **(06 Marks)**

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