Ref. No.: Ex/ME/5/T/121/2018 (Old)

B. MECHANICAL (PART TIME) 1st Year 2nd Semester Examination 2018 (OLD)

MANUFACTURING PROCESS

Time: 3hrs. Full Marks: 100

Answer any *five (5)* questions of the following.
Use pencil for drawing works.
The figures in the margin indicate full marks.

1. (a) Discuss, with a neat figure, the green sand molding technique using cope and drag halves. Mention about commonly used hand tools in this regard.
   (b) What are the desirable properties of good molding sand? Discuss clearly each of them. 10+10 = 20

2. (a) What is 'precision or investment casting'? State the important advantages and limitations of this process? Name five precision casting processes.
   (b) How the permeability of plaster mold can be increased?
   (c) Drawing adequate figures discuss about the following casting defects along with the possible remedies:
   (i) cold shut and misruns (ii) rat tails and buckles (iii) honey combing or sponginess. 8+3+(3×3)=20

3. (a) What are the different components of an ideal gating system? Discuss with necessary diagram. What is meant by pressurized and non-pressurized gates? Discuss with proper examples.
   (b) Why a sprue pin is made tapered? Discuss clearly drawing necessary figures.
   (c) Define core, core prints and chaplets. Draw all necessary diagrams. (6+4)+4+6=20

4. (a) Discuss about different pattern making allowances.
   (b) Drawing a neat and explanatory diagram discuss about the operation of an electric induction furnace. Also mention its important advantages and limitations. 10+10=20

5. (a) Deduce the expression for coefficient of spread as given by Tomlinson and Stringer. What is 'pancaking'? Explain with an explanatory figure.
   (b) A solid cylindrical slug of 304 SS is 150mm in diameter and 100mm high. The height is reduced to 30% by cold, open die forging. Assuming a coefficient of friction of 0.2

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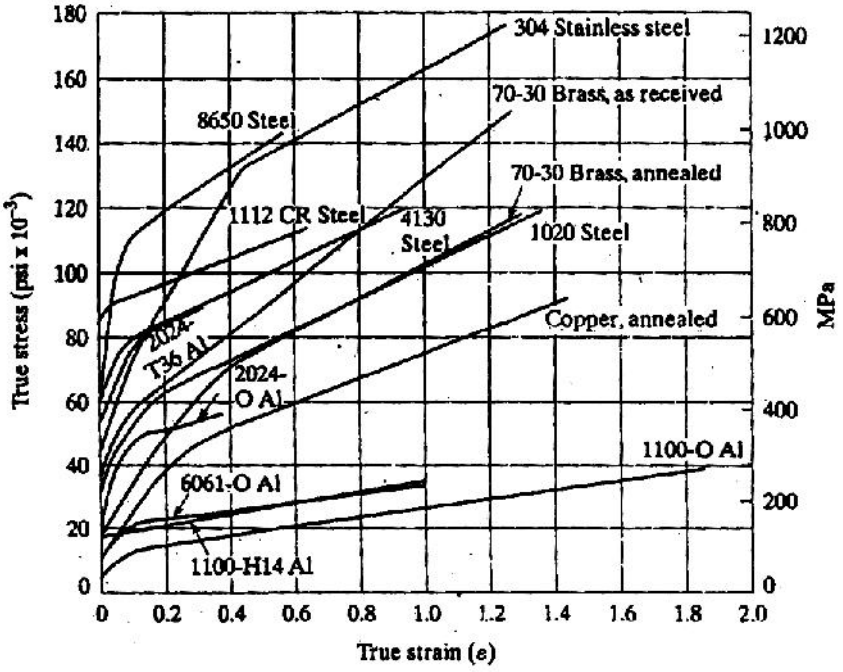
calculate the forging force needed at the end of stroke. The necessary graph is given below. (8+2)+10=20

6. (a) Show that the strip velocity at exit is much higher than that of at entry during a flat rolling operation. What is 'forward slip' and 'no slip' point? What is 'draft' in rolling?
(b) Determine the maximum possible reduction for cold rolling of a 300mm thick slab when μ=0.08 and the roll diameter is 600mm. What will be the reduction for hot rolling when μ=0.5? (6+2+2+2)+8=20

7. (a) Discuss about Thermit welding.
(b) What are the different power sources for arc welding? Mention the advantages and limitations of each.
(c) How acetylene gas is preserved in gas cylinder? 8+8+4=20

8. Write explanatory note on any four of the following:
(a) Drawing, deep drawing and hot draw bench
(b) Flame cutting
(c) Drop forging operation
(d) Laboratory method to obtain GFN
(e) Miller Index 4×5=20



Graph of true stress vs. true strain in connection with question no.5(b)