



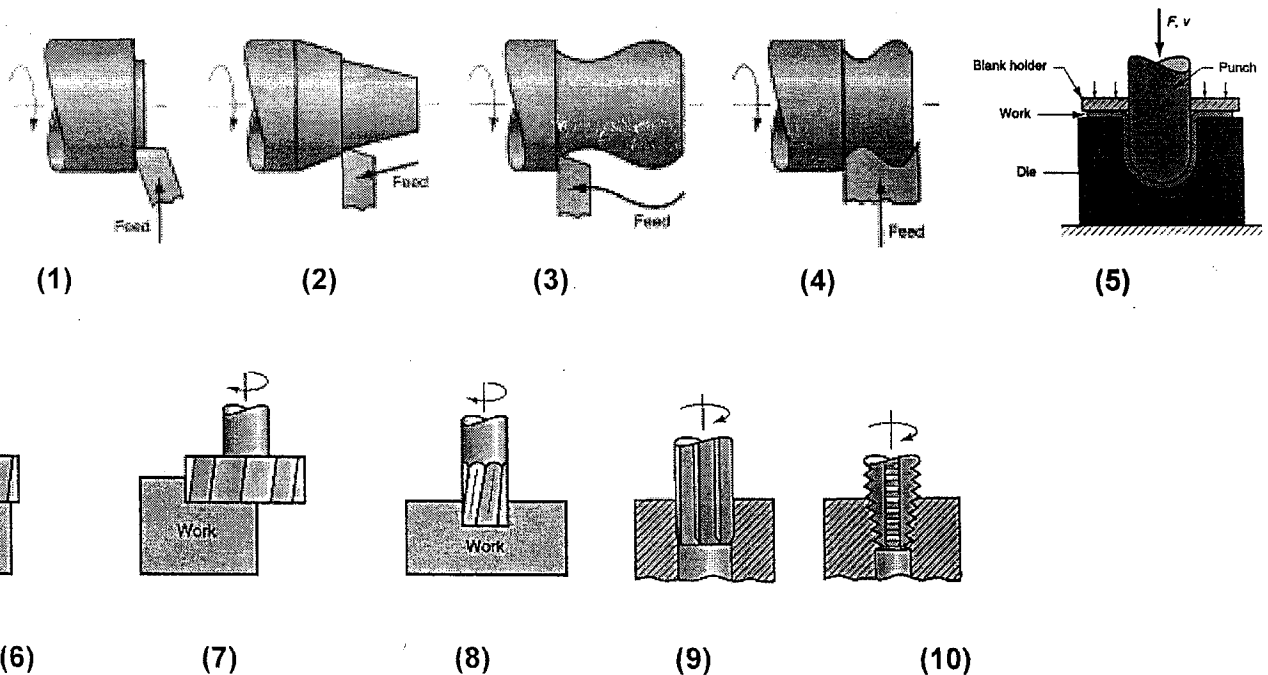
Course Name: Production technology
Course Code: PDE 042
Spring Semester Exam.
BME Program
Level 000
Exam Date: 31-05- 2018
Allowed Time: 2 Hours



Attempt all questions. Assume any missed data. Full mark is 50.

Q.1.a) Determine the name of processes

[10 Marks]



Q.2.a) Determine the angle at which the compound rest would be swiveled for cutting a taper on a workpiece having a length of 100 mm and outside diameter 90 mm. The smallest diameter on the tapered end of the rod should be 60 mm and the required length of the tapered portion is 50 mm. [3 Marks]

b) The volume flow rate of molten metal into the downsprue from the pouring cup is $40 \text{ in}^3/\text{sec}$. Determine what the area should be at the bottom of the sprue if its length = 10 in. It is desired to maintain a constant flow rate, top and bottom, in order to avoid aspiration of the liquid metal. [3 Marks]

c) A 250 mm wide strip 20 mm thick is fed through a rolling mill with two powered rolls each of radius = 200 mm. The work thickness is to be reduced to 16 mm in one pass at a roll speed of 40 rev/min. The work material has a flow curve defined by $K=275 \text{ MPa}$ and $n=0.15$, and the coefficient of friction between the rolls

and the work is assumed to be 0.12. calculate the roll force, torque, and horsepower. [4 Marks]

d) A heat source transfers 5000 W to the surface of a metal part. The heat impinges the surface in a circular area, with intensities varying inside the circle. The distribution is as follows: 60% of the power is transferred within a circle of diameter = 6 mm, and 95% is transferred within a concentric circle of diameter = 14 mm. What are the power densities in the 6- mm diameter inner circle. [2 Marks]

Q.3.a) Describe casting process briefly.

[2 Marks]

b) Compare between milling, drilling and turning process.

[4 Marks]

c) Describe briefly vacuum casting casting.

[3 Marks]

d) What is the difference between centrifugal and semi centrifugal casting.

[3 Marks]

e) Determine the basic types of solid state welding processes.

[3 Marks]

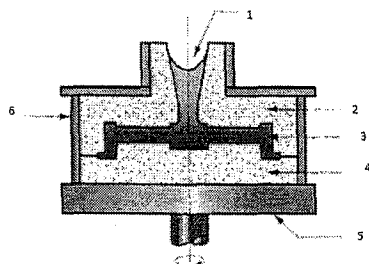
f) Determine disadvantages of hot and cold working (forming) process

[3 Marks]

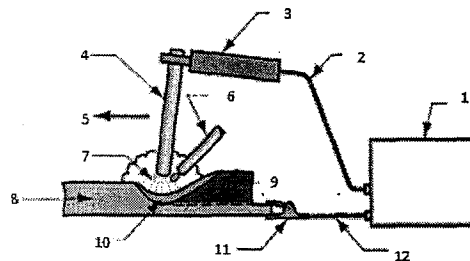
Q.4.a) Write the scientific word for the following . [4 Marks]

1. slab or plate is squeezed between opposing rolls.
2. work is squeezed and shaped between opposing dies.
3. work is squeezed through a die opening, thereby taking the shape of the opening.
4. diameter of wire or bar is reduced by pulling it through a die opening.

b) Fill the missing parts and write the name of process. [4 Marks]

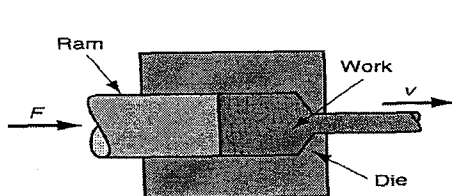


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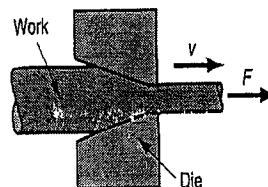


(2)

(c) Write the name of the process [4 Marks]



(1)



(2)

My best wishes to all of you!

Dr. Fatma Elerian