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Continuing Education Course #260
Introduction to Manufacturing Methods for Metals
Part 1 Casting and Forging Methods

1. Which of the following casting methods does not use expendable molds?
- a. Sand casting
- b. Die casting
- c. Investment casting
- d. All methods listed use expendable molds

2. Which of the following is an approximate full-sized duplicate of the final sand cast part that is used to form the mold cavity?
- a. Core
- b. Sprue
- c. Drag
- d. Pattern

3. Cereal flours, such as corn or wheat, are sometimes used as an additive for molding sand in sand casting. What is the purpose of the cereal flours?
- a. The cereal flour will burn in the heat to leave voids to allow the sand to expand
- b. The cereal flour is added because natural sand does not stick effectively
- c. The cereal flour is added to provide a mixture that will harden at room temperature.
- d. All of the above

4. The feature of the sand mold that carries the molten metal from the sprue to the mold cavity is known as
- a. the pouring basin
- b. the flask
- c. the runner system
- d. the risers

5. Which of the following statements is true about risers in a sand casting mold?
- a. Risers are typically a shape that provides a low volume to area ratio
- b. Risers must solidify last
- c. Risers should be placed so the casting solidifies away from the riser
- d. None of the statements are true

6. Which casting method is also known as lost wax casting?
- a. Permanent mold casting
- b. Investment casting
- c. Die casting
- d. Sand casting

7. Die casting is primarily limited to nonferrous alloys due to the high temperatures required for ferrous metals

- a. True
- b. False

8. Selecting the best casting process for a particular part depends on which of the following?
- a. The type of metal used
- b. The required number of parts to manufacture
- c. The required dimensional accuracy and surface quality of the part
- d. All of the above

9. In forging, the grain flow follows the overall shape of the part. Which of the following is a result of the grain flow?
- a. The part will be stronger
- b. The part will have a lower ductility
- c. Both choices are true

10. In open die forging, the workpiece will compress between the flat dies and increase in diameter. If friction exists between the workpiece and the die surface the increase in diameter will be less at the die surface and more in the central region. This non-homogeneous deformation is known as what?
- a. Barreling
- b. Upsetting
- c. Flash
- d. Cogging

11. Which of the following methods best describes a specialized hot forging method in which the die surfaces are heated to reduce heat transfer from the workpiece into the tooling?
- a. Cogging
- b. Roll forging
- c. Friction forging
- d. Isothermal forging

12. A variation of forging used to produce seamless ring shapes is known as which of the following?
- a. Ring rolling
- b. Rotational die forging
- c. Flashless forging
- d. Piercing

13. Metals such as aluminum and magnesium alloys are sometimes forged with zero machining allowance because the materials do not oxidize significantly at the temperature used in forging.
- a. True
- b. False

14. In forging, draft aids in the removal of the forging from the die. Typical draft angles for forging are which of the following?
- a. 7° for exterior edges and 10° for interior edges
- b. 10° for exterior edges and 7° for interior edges
- c. 2° for exterior edges and 5° for interior edges
- d. 5° for exterior edges and 2° for interior edges

15. Which of the following statements is true about forgeability?
- a. Alloys such as aluminum, magnesium, and copper have the lowest forgeability
- b. Fine grain metals have a higher forgeability
- c. Tungsten and beryllium have the best forgeability
- d. None of the statements are true