Manufacturing Processes - AMEM 201

- Review Questions -

1st group of Review Questions

1. Which one of the following are the three basic types of static stresses to which a material can be subjected? (three correct answers):
   (a) compression, (b) hardness, (c) reduction in area, (d) shear, (e) tensile, (f) true stress, and (f) yield?

   1. Answer. (a), (d), and (e).

2. Which one of the following are mechanical properties of materials? (six correct answers):
   (a) strength, (b) boiling point (c) toughness, (d) hardness,(e) conductivity (f) ductility, (g) density (h) elasticity, (i) fatigue, (j) specific heat, (k) melting point

   2. Answer. (a), (c), (d), (f), (h) and (i)

3. In machine tools where different components are made of different components, the assembly may jam, or become too loose and vibrate, when the temperature changes. Their design must account and compensate for the materials used their: (a) ductility, (b) density, (c) fatigue, (d) elasticity, (e) thermal expansion

   3. Answer. (e)

4. The plastic region of the stress-strain curve for a metal is characterized by a proportional relationship between stress and strain: (a) true or (b) false?

   4. Answer. (b).

5. Which one of the following materials has the highest hardness: (a) aluminum, (b) diamond, (c) steel, (d) titanium, or (e) tungsten?

   5. Answer. (b).

6. Most hardness tests involve pressing a hard object into the surface of a test specimen and measuring the indentation (or its effect) that results: (a) true or (b) false?

   6. Answer. (a).
7. Steel is a good material for the wrecking ball used to demolish old buildings because of its (a) high density (b) low elasticity (c) high coefficient of linear thermal expansion (d) low fatigue (e) poor ductility

7. Answer. (a)

8. Which one of the following metals has the lowest density: (a) aluminum, (b) copper, (c) magnesium, or (d) tin?

8. Answer. (c).

9. Due to its poor thermal conductivity, titanium can be easily machined on a milling machine: (a) true or (b) false?

9 Answer. (b).

10. Which of the following pure metals is the best conductor of electricity: (a) aluminum, (b) copper, (c) gold, or (d) silver?

10. Answer. (d).

11. Which one of the following casting processes is the most widely used: (a) centrifugal casting, (b) die casting, (c) investment casting, (d) sand casting, or (e) shell casting?

11. Answer. (d).

12. Compared to others casting processes, investment casting process is the best solution for manufacturing of (a) engine blocks (b) gears (c) jewellery (d) car wheels (e) pipes

12. Answer. (c).

13. In sand casting, the volumetric size of the pattern is (a) bigger than, (b) the same size as, or (c) smaller than the cast part?


14. Which of the following casting processes are expendable mold operations (three correct answers): (a) centrifugal casting, (b) die casting, (c) investment casting, (d) sand casting, (f) shell molding, and (h) vacuum casting?

14. Answer. (c), (d) and (f).
15. Shell molding is best described by which one of the following: (a) casting operation in which the molten metal has been poured out after a thin shell has been solidified in the mold, (b) casting process in which the mold is a thin shell of sand binded by a thermosetting resin, (c) sand casting operation in which the pattern is a shell rather than a solid form, or (d) casting operation used to make artificial sea shells?

15. Answer. (b).

16. Investment casting is also known by which one of the following names: (a) fast-payback molding, (b) full-mold process, (c) lost-foam process, (d) lost pattern process, or (e) lost-wax process?

16. Answer. (e).

17. Which of the following casting processes are permanent mold operations (three correct answers): (a) centrifugal casting, (b) die casting, (c) expanded polystyrene process, (d) sand casting, (e) shell molding, (f) vacuum casting.

17. Answer. (a), (b) and (f).

18. Which of the following metals would typically be used in die casting (two best answers): (a) aluminum, (b) cast iron, (c) steel, (d) tungsten, and (e) zinc?

18. Answer. (a), and (e).

19. Which of the following are advantages of die casting over sand casting (four best answers): (a) better surface finish, (b) closer tolerances, (c) higher melting temperature metals, (d) higher production rates, (e) larger parts can be cast, and (f) mold can be reused?

19. Answer. (a), (b), (d), and (f).

20. Which one of the following casting metals is most important commercially: (a) aluminum and its alloys, (b) bronze, (c) cast iron, (d) cast steel, or (e) zinc alloys?

20. Answer. (c).