Multiple Choice Quiz: Section 1.2: Classification

_____ 1. What is a characteristic of thermosets?

A decompose on heating

B have short cure cycles

C have high strain at failure

D soften on heating

_____ 2. What is a characteristic of thermoplastics?

A decompose on heating

B soften on heating

C have long cure cycles

D are tacky

_____ 3. The tail fin of Airbus A310-300 is made of composites. How much was the mass of the tail fin, as compared to the metal fin, reduced by?

A 30000 kg

B 3000 kg

C 30 kg

D 300 kg

_____ 4. What properties may degrade by reinforcing metals with fibers?

A ductility and strength

B strength and fracture toughness

C ductility and toughness

D ductility and fracture toughness

_____ 5. What does PMC stand for?

A Polymer Matrix Composite.

B Polyethylene Metal Composition.

C Polymer Metal Composition.

_____ 6. What does CMC stand for?

A ceramic matrix compounds

B ceramic matrix composites

C ceramic metal composites

D ceramic material composites

_____ 7. What are the current service temperature limits for metals approximately?

A 2800°F

B 800°F

C 3700°F

D 1800°F

_____ 8. What are the current service temperature limits for ceramics?

A 2800°F

B 3700°F

C 1800°F

D 800°F

_____ 9. What is E-glass type fiber used for?

A Evaporative applications.

B Electrical applications.

C Environmental applications.

_____ 10. What does SMC stand for?

A Sheet Molding Compound.

B Structural Metal Composite.

C Strong Metal Composite.

_____ 11. What are the most common fibers used in advanced polymer composites?

A Glass, Steel, and Aluminum

B Glass, Steel, and Kevlar

C Glass, Steel, and Graphite

D Glass, Graphite, and Kevlar

_____ 12. One of the main reasons C-C composites are used in aircraft brakes is the specific heat of C-C composites. How many times that of steel is the specific heat of C-C composites?

A 5.0

B 1.0

C 0.5

D 2.5

_____ 13. A typical range of carbon content in carbon fiber is

A 93-95%.

B 90-95%.

C 93-94%.

D 92-95%.

_____ 14. Graphite fibers have one of the following carbon content

A 99%.

B 98%.

C more than 99%.

D less than 99%.

_____ 15. What elements are aramid fibers made up of?

A Carbon, Hydrogen, Oxygen and Nitrogen

B Carbon, Hydrogen, Oxygen and Graphite

C Carbon, Hydrogen, Nitrogen

D Carbon, Hydrogen, Oxygen

_____ 16. Thermoset plastic polymers have the following type of bonding

A Atomic bond.

B Covalent bond.

C Vanderwaals bond.

_____ 17. Which one of these is a thermoplastic?

A Polyesters

B Polyethylene

C Epoxy

D Phenolics

_____ 18. What are the current service temperature limits polymers can reach?

A 350 degrees Fahrenheit.

B 750 degrees Fahrenheit.

C 450 degrees Fahrenheit.

D 1750 degrees Fahrenheit.

_____ 19. What is the main reason for reinforcing ceramics with fibers?

A Increase compressive strength

B Increase service temperature

C Increase fracture toughness

D Increase resistance to corrosion

_____ 20. What type of composites are most mechanical fasteners made of?

A Carbon-Carbon.

B Graphite-Epoxy.

C Boron-Epoxy.

_____ 21. What approximate range of temperatures do satellites face in space?

A –550°F to 200°F

B –550°F to 550°F

C –250°F to 200°F

D –250°F to 550°F

_____ 22. If I tell you that the specific gravity of steel is 7.8, what is the specific gravity of a graphite fiber approximately equal to?

A 7.8

B 1.0

C 2.6

D 1.8

_____ 23. Which one of these is a typical example of thermoplastics?

A polyethylene.

B phenolics.

C polyesters.

_____ 24. What manufacturing method is used for short production runs of polymer matrix composite structures in the automotive industry?

A autoclave forming.

B resin transfer molding.

C filament winding.

_____ 25. Which of the following composites are replacing metals in golf club shafts?

A Graphite-Epoxy.

B Boron-Epoxy.

C Carbon-Carbon.

_____ 26. Which of the following is a drawback for phenolic resin systems?

A low mechanical strength.

B brittleness.

C high cost.

D high void content.

_____ 27. Which fiber reinforcement is most used for bullet proof vests?

A Glass.

B Kelvar.

C Boron.

D Graphite.

_____ 28. What does the D in D-glass fibers stand for?

A diuretic

B delicate

C dielectric

_____ 29. What are glass fibers are made from?

A slice glass.

B vapor deposition method.

C graphite.

_____ 30. Which polymer is not desirable for smoke emission?

A Polyester.

B Polymide.

C Phenolic.

D Silicone.

_____ 31. Which polymer has the maximum strength?

A Polymide.

B Phenolic.

C Epoxy.

D Polyester.

_____ 32. For low smoke emission, which is the best polymer to use out of the polymers given below?

A silicone

B phenolic

C polyester

D epoxy

_____ 33. Which of these polymers has the highest service temperature?

A Polyester.

B Polymide.

C Phenolic.

D Epoxy.

_____ 34. Out of the polymers given below, which one has the lowest cost?

A polyester

B epoxy

C phenolic

D silicone

_____ 35. What does RTM stand for?

A resin transfer matrix

B resin total molding

C resin transfer mixing

D resin transfer molding

_____ 36. Which of these is an example of aramid fibers?

A Kevlar

B Graphite

C Boron

D Glass

_____ 37. Which of the polymers given below is the most desirable for low smoke emission?

A polyester

B phenolic

C silicone

D epoxy

_____ 38. What is one of the reasons composite materials are chosen for space applications?

A moisture absorption capability

B low specific strength

C dimensional stability

D low specific modulus

_____ 39. Thermosetting resins have three curing stages. At what stage does it result in irreversible hardening and insolubility?

A B

B A

C C

D D

_____ 40. What is the primary source of ceramic matrix composites in improving toughness?

A weak interfaces that blunt fiber cracks

B strong interfaces that continue the matrix cracks

C weak interfaces that blunt matrix cracks

D strong interfaces that continue the fiber cracks