

Provide the correct answer as a word, phrase or sentence. (3 points each)

- 1) Define Matter.
- 2) What is ENERGY?
- 3) Give an example of an endothermic process.
- 4) Give an example of an exothermic process.
- 5) Give an example of an element.
- 6) Give an example of a compound.
- 7) Describe filtration.
- 8) Describe distillation.
- 9) What is the difference between a mixture and a pure substance?
- 10) Describe the relationship between movement of particles and the phases of matter: solid, liquid and gas. (how much are particles moving in each phase)
- 11) Describe the three phases of matter in regard to shape and volume.

12) If I am heating metal rods made of different materials with the same amount of energy, which be the hottest and **why**? The rods are Aluminum (specific heat $0.89 \text{ J/g}^\circ\text{C}$), Gold ($0.13 \text{ J/g}^\circ\text{C}$) and Iron ($0.45 \text{ J/g}^\circ\text{C}$).

13) Choose a substance and describe it with a chemical property and a physical property.

Substance:

Chemical Property:

Physical Property:

14) Choose a substance and describe how you would change it chemically and how you would change it physically.

Substance:

Chemical Change:

Physical Change:

15) Describe what the Tyndall Test would show for the following mixtures:

Colloid:

Solution:

Suspension:

16) Explain the difference between a Calorie and a calorie.

Answer the question. (2 points each)

- 17) Which is larger, a calorie or a joule?
- 18) Physical changes involve overcoming what type of force?
- 19) What happens to the density of water as it freezes?
- 20) Describing an object's density is what type of property?
- 21) If an object "resists rusting", this is describing what type of property?
- 22) If a change occurs and a new substance is formed. This describes what type of change?

Define the following (2 points each)

- 23) What is the normal freezing point of water?
- 24) What is the normal boiling point of water?
- 25) Define Heat of Fusion.
- 26) Define Heat of Vaporization.
- 27) Define Temperature
- 28) Define Heat
- 29) Define Homogeneous mixture
- 30) Define Heterogeneous mixture

Solve the following problems. Round to proper significant digits. Show your work!

31) Convert 85.7 kilojoules to calories. (3 points)

32) Convert 36.7 kilocalories to joules. (3 points)

33) Convert 32.1 joules to calories. (3 points)

34) Convert 56.7 calories to joules(3 points)

35) Convert 45.7 kilocalories to kilojoules(3 points)

36) Convert 67.2 kilojoules to kilocalories(3 points)

37) Convert 85.7 joules to kilocalories. (3 points)

38) Convert 36.7 calories to kilojoules. (3 points)

Solve the following problems. Round to proper significant digits. Show your work!

39) How many joules are needed to heat 275 grams of gold from 34.8°C to 45.8°C ? The specific heat of gold is $0.130 \text{ J/g}^{\circ}\text{C}$. (4 points)

40) If I heat a block of carbon (specific heat = $0.710 \text{ J/g}^{\circ}\text{C}$) using 450 joules of energy and the temperature increases 23.8°C , what is the mass of my block? (4 points)

41) If I heat a 34.6 gram block of silver (specific heat = $0.240 \text{ J/g}^{\circ}\text{C}$) using 50 joules of energy, what temperature change will the block experience? (4 points)

42) If the starting temperature of the block in question #41 is 25°C what is the final temperature? HINT: final temp = starting temp + temp change. (3 points)

43) If it takes 856 joules of energy to heat a 134 gram sample from 21°C to 30°C , what is the specific heat of my sample? (4 points)

44) If the specific heat of iron is $0.45 \text{ J/g}^{\circ}\text{C}$ and the specific heat of carbon is $0.71 \text{ J/g}^{\circ}\text{C}$ is the sample in Question #25 iron or carbon? (3 points)

You may need the following information to answer the questions:

Specific heat of water= 4.184 J/g°C Specific heat of steam= 1.84 J/g°C

Specific heat of ice= 2.09 J/g°C

Heat of fusion of water= 6.02 kJ/18 grams Heat of vaporization of water= 40.6 kJ/18 grams

45) How much energy is needed to vaporize 35.6 grams of water at 100.00 °C? (4 points)

46) How much energy must be removed to freeze 35.6 grams of water? (4 points)

47) How many JOULES are needed to heat a 3.93 gram block of ice from -20.0°C to water at 47.5 °C? (7 points)

48) How many JOULES are needed to heat a 92.6 gram sample of water from 20.0°C to steam at 123 °C? (7 points)

- 49) How many KILOJOULES are released when 256 grams of steam at 145°C are cooled to -25°C ? (11 points)

- 50) How many JOULES are needed to heat a 56.8 block of ice from -25°C to steam at 122°C ? (11 points)