Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Forensic Glass Analysis Exam**

**Matching**

1. Radical fracture
2. Concentric fracture
3. Silicon dioxide
4. Obsidian
5. Amorphous
6. Refraction
7. Density
8. Refraction Index
9. Becke line
10. Glass
11. A measure of how light bends as it passes from one substance to another
12. The ratio of the mass of an object to its volume, expressed by the equation X = mass/volume
13. Volcanic glass
14. A hard, amorphous, transparent material made by heating a mixture of sand and other additives
15. Without shape or form; applied to glass, it refers to having particles that are arranged randomly instead of in a definite pattern
16. SiO2 the chemical name for silica
17. A crack in the glass that extends outward like the spoke of a wheel from the point at which the glass was struck
18. The line created as refracted light becomes concentrated around the edges of the glass fragment
19. The change in the direction of light as it changes speed when moving from one substance into another
20. A crack in the glass from a rough circle around the point of impact

**Multiple Choice**

11.\_\_\_\_ Glass containing lead oxide.

a. Soda lime glass

b. Leaded glass

c. Tempered glass

d. Laminated glass

12.\_\_\_\_ Two sheets of ordinary glass bonded together with a plastic film a. Soda lime glass

b. Leaded glass

c. Tempered glass

d. Laminated glass

13.\_\_\_\_ The most common glass, which is inexpensive, and easy to melt and shape a. Soda lime glass

b. Leaded glass

c. Tempered glass

d. Laminated glass

14.\_\_\_\_ Glass which is strengthened by introducing stress through rapid heating and cooling of its surface.

a. Soda lime glass

b. Leaded glass

c. Tempered glass

d. Laminated glass

15.\_\_\_\_ What is the main ingredient in glass?

1. Sand
2. Soda (NaCO)
3. Metal oxides
4. Lime (CaO)

16.\_\_\_\_ Tempered glass is used in

a. Windshields in autos manufactured in the United States b. Crystal stemware

c. The side and rear windows of autos manufactured in the United States d. Both b and c

17.\_\_\_\_ Flotation is a method used by scientists to determine the \_\_\_\_\_\_ of a particle of glass.

1. Weight
2. Density
3. Temperature
4. Refraction index

18.\_\_\_\_ When a bullet penetrates a panel of glass, it leaves a crater shaped hole that a. Is wider on the exit side

b. Is wider on the entrance side

c. Forms randomly; the direction of impact cannot be determined by its appearance d. Both b and c

19.\_\_\_\_ Which statement is true about the fracturing of glass?

a. Concentric fractures form first on the same side as the destructive force

b. Radial cracks form afterwards, starting on the same side as the destructive force c. Radial cracks and concentric fractures are formed simultaneously

d. Radial cracks appear first starting on the side opposite the destructive force

20.\_\_\_\_ A piece of glass is immersed in a liquid, and it proceeds to float on the surface. This shows that the density of the glass is \_\_\_\_\_ the density of the liquid.

a. Equal to

b. Less than

c. More than

d. Not comparable

21.\_\_\_\_ If glass cannot be physically pieced together, the control and questioned glass are best compared by their

a. Weight and density

b. Color and density

c. Refractive index and density

d. Refractive index and weight

22.\_\_\_\_ Stress marks on the edge of a radial crack near the point of impact area. Parallel to the side on which the force was applied

b. Perpendicular to the side on which the force was applied c. Perpendicular to the side of the glass facing the outdoors

d. Parallel to the side opposite the side on which the force was applied

23.\_\_\_\_ The two most important physical properties of glass for forensic comparison area. Refractive index and weight

b. Refractive index and color

c. Color and density

d. Refractive index and density

24.\_\_\_\_ The larger opening of a crater-shaped hole in glass made by the penetration of a projectile indicates

a. The exit side of the glass

b. The entrance side of the glass

c. The projectile was traveling at a low velocity

d. That a bullet made the opening

25.\_\_\_\_ The fracture pattern of glass usually has a. Radial and concentric lines

b. Concentric lines

c. Radial lines

d. Directional lines

26.\_\_\_\_ Refractive index measures the speed of light in a vacuum to its speed in

1. Air
2. Water
3. Glass
4. Any given substance

27.\_\_\_\_ The formula for calculating the density of an object is mass per unit volume.

1. True
2. False

28.\_\_\_\_ The only way to analyze glass fragments at a crime scene is to assemble the fragments and physically fit them together like a jigsaw puzzle.

1. True
2. False

29.\_\_\_\_ Sodium carbonate and calcium dioxide are two substances that are added to silica as glass is made.

1. True
2. False

30.\_\_\_\_ It is possible to determine the sequence of impact by observing the existing fracture lines and their points of termination.

1. True
2. False

31.\_\_\_\_ Referencing the diagram below what is the correct sequence of impact. a. A first

b. B first

c. A and B simultaneously

d. sequence impossible to determine

