Chapter 6-I: Chemistry & Chemical Safety

Chapter Test | Multiple Choice | Esthetics Program

Name:	Date:	Score: / 50

Instructions: Circle the letter of the best answer. Each question is worth 1 point. Answer all 50 questions.

Section 1: Matter, Atoms & States of Matter

Atoms, molecules, compounds, pure substances, solid/liquid/gas, physical vs. chemical properties | Questions 1–12

1. The simplest form of matter is:

(a) An element	**(b)** A compound
(c) A molecule	**(d)** An atom

2. What is an atom?

(a) The structural unit that makes up an element	**(b)** A chemical compound that makes up an organ
(c) The same as a molecule	**(d)** A combination of two or more elements

3. How is a molecule formed?

(a) By joining two or more atoms physically	**(b)** By joining two or more atoms chemically
(c) By joining exactly two atoms chemically	**(d)** By joining exactly two atoms physically

4. What is a compound?

(a) A combination of two or more atoms of different elements united chemically, with a fixed composition and distinct properties	**(b)** A combination of three atoms of different elements united chemically
(c) A combination of five atoms of different elements united physically	**(d)** A combination of two or more atoms of different elements united physically

5. Water is a chemical:

(a) Atom	**(b)** Element
(c) Compound	**(d)** Mixture

6. Pure substances are:

(a) Physical combinations of matter in any proportions	**(b)** Chemical combinations of matter in definite (fixed) proportions
(c) Mixtures whose composition varies with the preparer	**(d)** Mixtures of two or more dissimilar substances

7. The term "organic" applies to:

(a) Only gasoline, plastic, and fertilizers	**(b)** Anything that is alcohol-free
(c) Anything that has ever been alive	**(d)** Everything that does not contain oxygen

8. Metals, minerals, and pure water are examples of:

(a) Organic chemistry	**(b)** Inorganic chemistry
(c) Surfactants	**(d)** Redox reactions

9. What are the distinct characteristics of solids?

(a) Definite volume AND definite shape	**(b)** Definite volume but no definite shape
(c) Neither definite volume nor definite shape	**(d)** Definite shape but no definite volume

10. What are the distinct characteristics of liquids?

(a) Definite volume AND definite shape	**(b)** Definite volume but no definite shape
(c) Neither definite volume nor definite shape	**(d)** Definite shape but no definite volume

11. What are the distinct characteristics of gases?

(a) Definite volume AND definite shape	**(b)** Definite volume but no definite shape
(c) Neither definite volume nor definite shape	**(d)** Definite shape but no definite volume

12. Rusting iron and burning wood are examples of changes in:

(a) Inorganic compounds	**(b)** Physical properties
(c) Organic compounds	**(d)** Chemical properties

Section 2: Mixtures: Solutions, Suspensions & Emulsions

Solutes, solvents, surfactants, emulsifiers, miscible vs. immiscible | *Questions 13–22*

13. Solutions, suspensions, and emulsions are:

(a) Physical mixtures that contain two or more different substances	**(b)** Chemical compounds that contain two or more different substances
(c) Surfactants	**(d)** Chemical mixtures that contain two or more different substances

14. A solute is:

(a) The substance that does the dissolving	**(b)** A blended mixture
(c) Water	**(d)** A substance that is dissolved in a solvent

15. To liquefy a solute, you use a:

(a) Solvent	**(b)** Solution
(c) Alcohol only	**(d)** Oil

16. If alcohol is used to dissolve a substance, the alcohol is acting as a:

(a) Solvent	**(b)** Catalyst
(c) Solute	**(d)** Surfactant

17. Water and alcohol are:

(a) Suspensions	**(b)** Miscible liquids
(c) Emulsions	**(d)** Immiscible liquids

18. An emulsion is formed by substances that are:

(a) Surfactant	**(b)** Alkaline
(c) Immiscible	**(d)** Miscible

19. Surfactants are present in:

(a) Emulsions	**(b)** Atoms
(c) Suspensions	**(d)** Solutions

20. What products act as a bridge to allow oil and water to mix or emulsify?

(a) Suspensions	**(b)** Surfactants
(c) Solutions	**(d)** None of the above

21. An emulsifier is:

(a) A substance that dissolves into water	**(b)** A special ingredient that keeps an emulsion blended
(c) A type of acid that lowers pH	**(d)** The same as a solute

22. Calamine lotion is a:

(a) Suspension	**(b)** Lipophile
(c) Solution	**(d)** Litmus

Section 3: Common Products & Their Chemistry

Lipophilic, hydrogen peroxide, soaps, aerosols, pH adjusters | *Questions 23–28*

23. Lipophilic means:

(a) Full of fat tissue	**(b)** Free of fat tissue
(c) Oil-loving	**(d)** Oil-dissolving

24. Hydrogen peroxide is:

(a) A solid	**(b)** A stone
(c) A gas	**(d)** A liquid

25. Soaps are:

(a) Highly acidic	**(b)** Miscible
(c) Alkaline	**(d)** Solutions

26. An aerosol comes in what form?

(a) Spray	**(b)** Gel
(c) Cream	**(d)** Liquid

27. Aerosol hair spray is a:

(a) Suspension	**(b)** Emulsion
(c) Solution	**(d)** Liquid

28. pH adjusters in a cosmetic formula:

(a) Are compounds made of sebum	**(b)** Keep the pH of the product at the correct level
(c) Form the acid mantle on the skin	**(d)** Irritate the skin and are avoided in skin care

Section 4: pH Scale & Acid/Alkali Chemistry

pH definition, scale, litmus, neutral range, alkalinity multiplier | *Questions 29–38*

29. What is pH?

(a) Potential hydrogen, measured on a scale of 0 to 7	**(b)** Potential hydrogen, measured on a scale of 5 to 14
(c) Potential hydrogen, measured on a scale of 0 to 24	**(d)** Potential hydrogen, measured on a scale of 0 to 14

30. Acids and alkalis are defined by their:

(a) Compounds	**(b)** Suspension
(c) States of matter	**(d)** pH

31. When litmus paper turns from blue to red, the substance is:

(a) Alkaline	**(b)** Acid
(c) pH 10.6	**(d)** pH 7.5

32. What is the pH of distilled water?

(a) 5.5	**(b)** 7
(c) 6.5	**(d)** 7.5

33. A pH of 8 is how many times more alkaline than a pH of 7?

(a) 10	**(b)** 100
(c) 2	**(d)** 20

34. A pH of 9 is how many times more alkaline than a pH of 7?

(a) 10	**(b)** 100
(c) 2	**(d)** 20

35. The neutral pH range is:

(a) pH 7.0 to 7.5	**(b)** pH 6.5 to 7.5
(c) pH 7.5 to 8.5	**(d)** pH 0

36. An acidic product would have a pH of:

(a) 0	**(b)** 1–6
(c) 7	**(d)** 8–14

37. On the pH scale, 14 is:

(a) Slightly alkaline	**(b)** Slightly acidic
(c) Highly alkaline	**(d)** Highly acidic

38. What effect would a product with a pH of 8 have on the skin?

(a) Harden	**(b)** Dry
(c) Soften	**(d)** Cause a rash

Section 5: Acid Mantle & Skin pH

Skin pH range, acid mantle composition, desincrustation | *Questions 39–42*

39. The typical pH range of skin is between:

(a) 6.2 and 7.5	**(b)** 7.0 and 7.5
(c) 4.5 and 6.2	**(d)** 4.5 and 7.5

40. The acid mantle of the skin is formed by:

(a) Sebum and water	**(b)** Sebum and sweat
(c) Oil and dead cells	**(d)** Water and oil

41. The acid mantle is:

(a) Formed by very strong acids	**(b)** A protective barrier on the skin
(c) Capable of causing chemical burns	**(d)** Determined by emulsion

42. What kind of reaction is desincrustation?

(a) Alkaline	**(b)** Neutral
(c) Highly acidic	**(d)** Slightly acidic

Section 6: Chemical Reactions in Esthetics

Neutralization, oxidation, redox, why reactions matter | *Questions 43–48*

43. The effects of a cosmetic product depend on:

(a) Organic plant products	**(b)** Chemical reactions
(c) Manufactured surfactants	**(d)** The laws of the social sciences

44. Which chemical reaction is most important for an esthetician to understand?

(a) Combustion	**(b)** Redox
(c) Reduction	**(d)** Acid-alkali neutralization

45. When you combine acid and alkali solutions in equal proportions, the result is:

(a) A strong acid	**(b)** Acid and water
(c) Salt and water	**(d)** A strong base

46. What is oxidation?

(a) A physical reaction that combines an element with oxygen	**(b)** A chemical reaction that combines an element or compound with oxygen to produce an oxide
(c) A chemical reaction that combines an element or compound with hydrogen	**(d)** A chemical reaction that combines an element or compound with nitrogen

47. Oxidation-reduction (redox) reactions include:

(a) Oxidation and combustion	**(b)** Reduction of chloride only
(c) Oxidation of plastic	**(d)** Deep exfoliation

48. Why are neutralization reactions important in beauty services?

(a) They are not used in beauty services	**(b)** They produce strong acids for exfoliation
(c) They cause chemical burns on contact	**(d)** They return the hair or skin to its natural pH

Section 7: Chemical Safety Basics

SDS purpose, storage fundamentals | *Questions 49–50*

49. What is the purpose of a Safety Data Sheet (SDS)?

(a) To list product prices	**(b)** To provide essential safety information about a chemical product
(c) To advertise new products	**(d)** To list ingredients in alphabetical order

50. Chemicals in the salon should be stored:

(a) In any available container	**(b)** In their original containers
(c) In food-grade plastic bags	**(d)** Mixed together to save space

— End of Test —