Physical World and Measurement Quiz

1. Which of the following is a fundamental quantity?

- ○ Velocity
- ○ Force
- ◉ Mass
- ○ Energy

2. What is the SI unit of luminous intensity?

- ○ Candela
- ○ Lux
- ◉ Lumen
- ○ Watt

3. Which of the following is not a derived quantity?

- ◉ Length
- ○ Speed
- ○ Acceleration
- ○ Momentum

4. What is the dimensional formula for force?

- ◉ $[M\ L\ T^{-2}]$
- ○ $[M\ L\ T^{-1}]$
- ○ $[M\ L^{2}\ T^{-2}]$
- ○ $[M\ L\ T^{-3}]$

5. Which of the following is a scalar quantity?

- ○ Velocity
- ○ Force
- ◉ Energy

○ Displacement

6. What is the SI unit of electric current?

○ Volt
◉ Ampere
○ Ohm
○ Coulomb

7. Which of the following is a dimensionless quantity?

◉ Refractive index
○ Force
○ Velocity
○ Energy

8. What is the SI unit of temperature?

◉ Kelvin
○ Celsius
○ Fahrenheit
○ Rankine

9. Which of the following has the dimensional formula [M L^2 T^-2]?

○ Energy
○ Force
◉ Momentum
○ Power

10. What is the SI unit of frequency?

◉ Hertz
○ Second
○ Meter
○ Newton

11. Which of the following is a vector quantity?

○ Mass
○ Speed

- (●) Velocity
- ( ) Temperature

12. What is the dimensional formula for pressure?

- (●) [M L^-1 T^-2]
- ( ) [M L T^-2]
- ( ) [M L^2 T^-2]
- ( ) [M L^-2 T^-2]

13. Which of the following is a derived unit?

- ( ) Meter
- ( ) Kilogram
- (●) Newton
- ( ) Second

14. What is the dimensional formula for velocity?

- ( ) [M L T^-1]
- (●) [L T^-1]
- ( ) [L T^-2]
- ( ) [M L^2 T^-2]

15. Which of the following is a fundamental unit?

- ( ) Joule
- (●) Meter
- ( ) Watt
- ( ) Pascal

16. Which physical quantity has the dimensional formula [M^0 L^0 T^0]?

- (●) Strain
- ( ) Energy
- ( ) Power
- ( ) Force

17. What is the SI unit of luminous flux?

- ○ Lumen
- ○ Candela
- ◉ Lux
- ○ Watt

18. Which derived unit corresponds to [kg·m²/s³]?

- ○ Watt
- ○ Joule
- ◉ Pascal
- ○ Volt

19. Which of the following is NOT a base quantity?

- ○ Temperature
- ○ Electric current
- ◉ Momentum
- ○ Length

20. What is the SI unit of solid angle?

- ◉ Steradian
- ○ Radian
- ○ Degree
- ○ Candela

21. Which of the following is an example of a vector quantity?

- ◉ Torque
- ○ Speed
- ○ Time
- ○ Energy

22. What is the dimensional formula for surface tension?

- ○ [M T^-2]
- ◉ [M L^0 T^-2]
- ○ [M T^-1]
- ○ [M L^-1 T^-2]

23. Which fundamental quantity is used to derive angular velocity?

- (●) Time
- ( ) Length
- ( ) Mass
- ( ) Current

24. The unit 'Newton-second' is used to measure:

- (●) Impulse
- ( ) Momentum
- ( ) Power
- ( ) Energy

25. What is the dimension of Planck's constant (h)?

- ( ) [M L^2 T^-1]
- (●) [M L^2 T^-2]
- ( ) [M L T^-2]
- ( ) [M L^-2 T]

26. Which pair is correctly matched?

- (●) Magnetic flux - Weber
- ( ) Electric current - Volt
- ( ) Force - Watt
- ( ) Work - Coulomb

27. Which term has the dimensional formula [M^0 L T^-1]?

- ( ) Angular velocity
- ( ) Acceleration
- (●) Speed
- ( ) Strain

28. Which unit is a measure of energy?

- (●) Joule
- ( ) Watt
- ( ) Ampere
- ( ) Newton

29. Which is a pair of base quantities in SI?

- (●) Temperature, Current
- ( ) Energy, Power
- ( ) Force, Time
- ( ) Pressure, Length

30. Which of the following expresses derived units only?

- ( ) Newton, Joule, Watt
- (●) Meter, Second, Kelvin
- ( ) Ampere, Candela, Mole
- ( ) Kilogram, Meter, Second

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Explanations:

1. Which of the following is a fundamental quantity?
Your Answer: Mass
Correct Answer: undefined
Explanation: Mass is a fundamental quantity. Others are derived from it.

2. What is the SI unit of luminous intensity?
Your Answer: Lumen
Correct Answer: undefined
Explanation: Candela is the SI unit of luminous intensity.

3. Which of the following is not a derived quantity?
Your Answer: Length
Correct Answer: undefined
Explanation: Length is a base physical quantity.

4. What is the dimensional formula for force?

Your Answer: [M L T^{-2}]
Correct Answer: undefined
Explanation: Force = mass × acceleration, so its dimension is [M L T^{-2}].

5. Which of the following is a scalar quantity?
Your Answer: Energy
Correct Answer: undefined
Explanation: Energy has magnitude but no direction.

6. What is the SI unit of electric current?
Your Answer: Ampere
Correct Answer: undefined
Explanation: Ampere is the base unit of electric current.

7. Which of the following is a dimensionless quantity?
Your Answer: Refractive index
Correct Answer: undefined
Explanation: Refractive index is the ratio of two speeds and hence dimensionless.

8. What is the SI unit of temperature?
Your Answer: Kelvin
Correct Answer: undefined
Explanation: Kelvin is the SI base unit for temperature.

9. Which of the following has the dimensional formula [M L^2 T^-2]?
Your Answer: Momentum
Correct Answer: undefined
Explanation: Energy or work = force × displacement = [M L^2 T^-2].

10. What is the SI unit of frequency?
Your Answer: Hertz
Correct Answer: undefined
Explanation: Hertz (Hz) is the number of cycles per second.

11. Which of the following is a vector quantity?
Your Answer: Velocity
Correct Answer: undefined
Explanation: Velocity has both magnitude and direction.

12. What is the dimensional formula for pressure?
Your Answer: [M L^-1 T^-2]
Correct Answer: undefined
Explanation: Pressure = force / area = [M L T^-2] / [L^2] = [M L^-1 T^-2].

13. Which of the following is a derived unit?
Your Answer: Newton
Correct Answer: undefined
Explanation: Newton is derived from kg·m/s².

14. What is the dimensional formula for velocity?
Your Answer: [L T^-1]
Correct Answer: undefined
Explanation: Velocity = displacement/time = [L]/[T] = [L T^-1].

15. Which of the following is a fundamental unit?
Your Answer: Meter
Correct Answer: undefined
Explanation: Meter is a base unit; others are derived.

16. Which physical quantity has the dimensional formula [M^0 L^0 T^0]?
Your Answer: Strain
Correct Answer: undefined
Explanation: Strain is a ratio of similar quantities and hence dimensionless.

17. What is the SI unit of luminous flux?
Your Answer: Lux
Correct Answer: undefined
Explanation: Lumen is the SI unit of luminous flux.

18. Which derived unit corresponds to [kg·m²/s³]?
Your Answer: Pascal
Correct Answer: undefined
Explanation: Watt is the unit of power and equals kg·m²/s³.

19. Which of the following is NOT a base quantity?
Your Answer: Momentum
Correct Answer: undefined

Explanation: Momentum is a derived quantity.

20. What is the SI unit of solid angle?
Your Answer: Steradian
Correct Answer: undefined
Explanation: Steradian is the unit of solid angle.

21. Which of the following is an example of a vector quantity?
Your Answer: Torque
Correct Answer: undefined
Explanation: Torque has both magnitude and direction.

22. What is the dimensional formula for surface tension?
Your Answer: [M L^0 T^-2]
Correct Answer: undefined
Explanation: Surface tension = force/length ⇒ [M L T^-2]/[L] = [M L^-1 T^-2].

23. Which fundamental quantity is used to derive angular velocity?
Your Answer: Time
Correct Answer: undefined
Explanation: Angular velocity is measured as angle per unit time.

24. The unit 'Newton-second' is used to measure:
Your Answer: Impulse
Correct Answer: undefined
Explanation: Impulse = force × time, and is measured in Newton-seconds.

25. What is the dimension of Planck's constant (h)?
Your Answer: [M L^2 T^-2]
Correct Answer: undefined
Explanation: Planck's constant links energy and frequency: E = hv.

26. Which pair is correctly matched?
Your Answer: Magnetic flux - Weber
Correct Answer: undefined
Explanation: Weber is the SI unit of magnetic flux.

27. Which term has the dimensional formula [M^0 L T^-1]?

Your Answer: Speed
Correct Answer: undefined
Explanation: Angular velocity has dimension of angle/time, where angle is dimensionless.

28. Which unit is a measure of energy?
Your Answer: Joule
Correct Answer: undefined
Explanation: Joule is the unit of work or energy.

29. Which is a pair of base quantities in SI?
Your Answer: Temperature, Current
Correct Answer: undefined
Explanation: Temperature (K) and electric current (A) are base quantities.

30. Which of the following expresses derived units only?
Your Answer: Meter, Second, Kelvin
Correct Answer: undefined
Explanation: All are derived from base units.