

Scientific Principles of Interior Design

Interior Design · Answer Key · 25 Questions

1. What is the primary scientific function of a 'thermal mass' in interior climate control?

- A) To filter airborne particulate matter
- B) To absorb and store heat energy to regulate indoor temperature fluctuations**
- C) To increase the aesthetic reflectivity of wall surfaces
- D) To reduce electromagnetic interference within a room

2. In color science, what does the 'Metameric Effect' imply for interior designers?

- A) Colors appear identical under one light source but different under another**
- B) The psychological reaction to red is universally faster than blue
- C) Material density changes the perceived hue of paint
- D) Neon colors possess higher light absorption rates than pastels

3. Which architectural concept describes the relationship between the human body and the scale of the built environment?

- A) Biophilic saturation
- B) Anthropometrics**
- C) Tectonic layering
- D) Gestalt integration

4. In lighting design, what does a Color Rendering Index (CRI) of 100 represent?

- A) The light source is 100% brighter than standard bulbs
- B) The light source provides the same color rendering as natural daylight**
- C) The light source consumes 100 watts of power
- D) The light source emits zero ultraviolet radiation

5. What is the 'Stack Effect' in the context of building ventilation?

- A) The layering of materials based on acoustic density
- B) The vertical movement of air caused by temperature-induced buoyancy**
- C) The process of stacking furniture to optimize floor space
- D) The refraction of light through multi-paned windows

6. What does the 'Sabine Formula' calculate in architectural acoustics?

- A) The light transmission coefficient of glass
- B) Reverberation time within a room**
- C) The structural load-bearing capacity of a joist
- D) Thermal conductivity of insulation materials

7. Which phenomenon explains the psychological discomfort caused by 'Sick Building Syndrome'?

- A) Lack of natural sunlight
- B) Poor indoor air quality due to biological or chemical contaminants**
- C) Excessive floor-to-ceiling heights
- D) High levels of sound absorption

8. What is the 'Inverse Square Law' specifically applied to in lighting design?

- A) The relationship between light intensity and the distance from the source**
- B) The cost efficiency of LED versus incandescent bulbs
- C) The saturation of color pigments on canvas
- D) The thickness of glass required to block sound

9. What is the core objective of 'Biophilic Design' as defined by Stephen Kellert?

- A) Maximizing the amount of artificial synthetic materials
- B) Creating buildings that mimic high-tech industrial aesthetics
- C) Increasing human connectivity to the natural environment**
- D) Reducing the total floor area of residential units

10. Which factor is primarily measured by the 'Lumens' unit in interior lighting?

- A) Total luminous flux emitted by a source**
- B) The intensity of heat generated by a filament
- C) The color temperature measured in Kelvin
- D) The physical size of the light fixture

11. In terms of fire safety, what does 'Flame Spread Index' (FSI) measure?

- A) The total heat output of a burning material
- B) The speed at which a flame travels across a surface**
- C) The toxicity of smoke produced during combustion
- D) The time taken for a material to self-extinguish

12. Which standard defines the 'Accessibility' requirements for interior spaces in many jurisdictions?

- A) ISO 9001
- B) ADA Standards for Accessible Design**
- C) The Golden Ratio Principle
- D) The Bauhaus Manifesto

13. What is 'Specular Reflection' in the context of interior surface finishes?

- A) Diffuse scattering of light in all directions
- B) Mirror-like reflection from a smooth surface**
- C) The absorption of light by matte pigments
- D) The transmission of light through translucent materials

14. In HVAC design, what does 'ASHRAE' stand for?

- A) American Society of Heating, Refrigerating and Air-Conditioning Engineers**
- B) Association of Standard Housing and Residential Architectural Environments
- C) Advanced Structural Housing and Renewable Energy
- D) Applied Science of Human-Related Architectural Efficiency

15. What is the 'JND' (Just Noticeable Difference) in perceptual design?

- A) The minimum amount of change in a stimulus required for detection**
- B) The maximum capacity of a storage unit
- C) The distance between two parallel walls
- D) The frequency at which color begins to fade

16. Which material property describes the ability of a substance to resist the flow of heat?

- A) Thermal mass
- B) R-value**
- C) Refractive index
- D) Elastic modulus

17. What is the primary purpose of an 'Intumescent' coating in interior architecture?

- A) To provide a decorative glossy finish
- B) To expand when exposed to heat, providing fire insulation**
- C) To improve the acoustic absorption of a wall
- D) To repel dust and allergens from surfaces

18. What effect does high-frequency sound waves have on porous interior materials?

- A) Reflection
- B) Diffraction
- C) Absorption**
- D) Refraction

19. What is the scientific basis for the 'Circadian Lighting' design strategy?

- A) Matching light spectrums to the human internal biological clock**
- B) Decreasing electricity costs by 50%
- C) Using sound-dampening acoustic panels
- D) Maximizing the floor-to-ceiling window ratio

20. What does 'Egress' refer to in architectural building codes?

- A) The structural load of a floor
- B) The paths available for exiting a building during an emergency**
- C) The lighting levels required for a foyer
- D) The ventilation rate of a kitchen

21. Which property of glass is specifically reduced by 'Low-E' (low-emissivity) coatings?

- A) Transparency to visible light
- B) Transmission of infrared energy**
- C) Resistance to impact
- D) Electrical conductivity

22. What is the 'Visual Comfort Probability' (VCP) used to measure in lighting?

- A) The probability that a light will fail
- B) The percentage of people who will find a lighting system visually comfortable**
- C) The likelihood that a light source will cause a fire
- D) The cost of the lighting installation

23. Which component of sound is primarily addressed by using 'Diffusers' on walls?

- A) Sound reflection patterns**
- B) The absolute volume of the sound
- C) The thermal properties of the wall
- D) The structural integrity of the partition

24. What is the main function of a 'Vapor Barrier' in wall construction?

- A) To prevent moisture migration into the building envelope**
- B) To increase the aesthetic appeal of a wall
- C) To provide structural rigidity to the wall stud
- D) To reduce the sound transmission between rooms

25. In interior material selection, what does 'VOC' stand for?

- A) Volatile Organic Compound**
- B) Visual Operational Coefficient
- C) Vibrational Oscillation Capacity
- D) Velocity Of Construction