Refraction Through Glass Slab

Here are 20 multiple-choice questions (MCQs) based on the concept of "Refraction of Light through a Glass Slab":

1. **What is the refractive index of glass typically compared to air?**
   - a) Less than 1
   - b) Equal to 1
   - c) Greater than 1
   - d) Exactly 2
2. **When light passes from air into glass, what happens to its speed?**
   - a) Increases
   - b) Decreases
   - c) Remains the same
   - d) Becomes zero
3. **The angle of incidence equals the angle of refraction when light enters which type of medium?**
   - a) Glass slab
   - b) Water
   - c) Air
   - d) Vacuum
4. **What is the phenomenon called when light bends while passing through a glass slab?**
   - a) Reflection
   - b) Refraction
   - c) Dispersion
   - d) Diffraction
5. **When light travels from glass to air, how does the angle of refraction compare to the angle of incidence?**
   - a) Equal
   - b) Less than
   - c) Greater than
   - d) Twice
6. **If the angle of incidence is 30° and the refractive index of glass is 1.5, what is the angle of refraction?**
   - a) 19.47°
   - b) 30°
   - c) 45°
   - d) 60°
7. **What is the lateral shift of light when it passes through a glass slab?**
   - a) The distance between the emergent and incident rays
   - b) The thickness of the slab
   - c) The angle of refraction
   - d) The height of the glass slab
8. **Which law is used to calculate the angle of refraction in a glass slab?**
   - a) Law of reflection

- b) Snell's Law
- c) Planck’s Law
- d) Hooke’s Law

9. **What is the critical angle for glass-air interface?**
   - a) 90°
   - b) 45°
   - c) Approximately 42°
   - d) 60°
10. **In refraction through a glass slab, which of the following remains unchanged?**
   - a) Wavelength
   - b) Speed
   - c) Frequency
   - d) Direction
11. **If a ray of light strikes the glass slab perpendicularly, what will happen?**
   - a) It will bend towards the normal
   - b) It will bend away from the normal
   - c) It will pass straight through without bending
   - d) It will be reflected back
12. **The emergent ray from a glass slab is parallel to the incident ray but displaced. What is this displacement called?**
   - a) Normal shift
   - b) Lateral displacement
   - c) Angular shift
   - d) Reflection
13. **Which factor does not affect the lateral shift in a glass slab?**
   - a) Thickness of the slab
   - b) Angle of incidence
   - c) Refractive index of the glass
   - d) Speed of light in air
14. **If the refractive index of glass increases, what happens to the lateral shift?**
   - a) Increases
   - b) Decreases
   - c) Remains the same
   - d) Becomes zero
15. **The ratio of the sine of the angle of incidence to the sine of the angle of refraction is called:**
   - a) Reflection coefficient
   - b) Snell’s ratio
   - c) Refractive index
   - d) Optical density
16. **What happens to the wavelength of light when it passes through a denser medium like glass?**
   - a) Increases
   - b) Decreases
   - c) Remains the same
   - d) Becomes zero
17. **What causes the lateral displacement in a glass slab?**
   - a) Change in speed of light
   - b) Change in frequency
   - c) Refraction at the boundaries
   - d) Dispersion of light

18. **Which of the following is true for refraction through a glass slab?**
    - a) The emergent ray is perpendicular to the incident ray.
    - b) The emergent ray is parallel to the incident ray.
    - c) The refracted ray always bends away from the normal.
    - d) The angle of refraction is always 90°.
19. **What is the optical path length in a glass slab?**
    - a) The actual length traveled by light
    - b) The product of refractive index and thickness of the slab
    - c) The speed of light in air
    - d) The thickness of the glass slab
20. **If the angle of incidence is 0°, what is the angle of refraction?**
    - a) 0°
    - b) 90°
    - c) 45°
    - d) Cannot be determined

Key:

1. c) Greater than 1
2. b) Decreases
3. c) Air
4. b) Refraction
5. c) Greater than
6. a) 19.47°
7. a) The distance between the emergent and incident rays
8. b) Snell's Law
9. c) Approximately 42°
10. c) Frequency
11. c) It will pass straight through without bending
12. b) Lateral displacement
13. d) Speed of light in air
14. a) Increases
15. c) Refractive index
16. b) Decreases
17. c) Refraction at the boundaries
18. b) The emergent ray is parallel to the incident ray
19. b) The product of refractive index and thickness of the slab
20. a) 0°