

## CHAPTER-4 | Laws of Motion

QUIZ  
PART-04

1. When a lift moves upward with acceleration (a), the reaction force on a person of mass is:  
A.  $mg$   
B.  $m(g-a)$   
C.  $m(g+a)$   
D. Zero (C)

**Explanation :** In upward acceleration, the apparent weight increases as  $R = m(g+a)$ .

2. The force that resists relative motion between two bodies in contact is called:  
A. Normal force  
B. Frictional force  
C. Tension  
D. Spring force (B)

**Explanation :** Friction always acts opposite to relative motion between surfaces.

3. Which of the following is true about limiting friction?  
A. Depends on the area of contact  
B. Independent of the nature of surfaces  
C. Proportional to normal reaction  
D. Acts in the direction of motion (C)

**Explanation :** Limiting friction follows  $f_s = \mu_s R$ , directly proportional to the normal force.

4. If a lift is in free fall, the apparent weight of a body inside is:  
A.  $mg$   
B. Zero  
C.  $m(g+a)$   
D.  $m(g-a)$  (B)

**Explanation :** In free fall, reaction force vanishes and weightlessness occurs.

5. The coefficient of static friction ( $\mu_s$ ) is equal to:  
A.  $\tan \theta$  (angle of repose)  
B.  $\sin \theta$   
C.  $\cos \theta$   
D.  $\cot \theta$  (A)

**Explanation :** At the angle of repose,  $\tan \theta = \mu_s$ .

6. Which type of friction is the smallest in magnitude?  
A. Rolling friction  
B. Sliding friction  
C. Kinetic friction  
D. Static friction (A)

**Explanation :** The hierarchy is Rolling < Kinetic < Sliding friction.

7. When two surfaces just begin to slide over each other, the frictional force acting is:  
A. Static friction  
B. Kinetic friction  
C. Limiting friction  
D. Rolling friction (C)

**Explanation :** Limiting friction is the maximum static friction, just before motion begins.

8. Which factor does not affect the limiting friction between two surfaces?  
A. Nature of surfaces  
B. Normal reaction force  
C. Area of contact  
D. Coefficient of friction (C)

**Explanation :** Friction is independent of the area of contact.

9. The reaction force exerted by a table on a block resting on it is directed:  
A. Downward by the table  
B. Upward by the table  
C. Downward by the block  
D. Horizontal (B)

**Explanation :** The normal reaction always acts perpendicular to the surface, upward here.

10. For a body on an inclined plane just at rest, the angle of repose is:  
A. Equal to the angle of friction  
B. Greater than the angle of friction  
C. Less than the angle of friction  
D. Independent of friction (A)

**Explanation :** The condition gives  $\theta = \lambda$ , where  $\theta$  is angle of repose and  $\lambda$  angle of friction.