



St. Lawrence High School  
A Jesuit Christian Minority Institution



Term : 1<sup>st</sup>

Solution of Work Sheet – 17

Class – XI

Subject – Physics

Date – 03.07.20

Chapter – Friction

Topic – Static and Kinetic friction

Choose the correct option for the following questions.

1 × 15 = 15

1. The kinetic frictional force developed between two surfaces depends on –
- The area of contact of two surfaces
  - The relative velocity between them
  - The normal reaction acting in the contact surface
  - All of the above

**Ans: c. The normal reaction acting in the contact surface**

2. For two specific bodies, the constant factor is –
- The static frictional force
  - The kinetic frictional force
  - Both
  - None

**Ans: b. The kinetic frictional force**

3. Frictional force is present, when –
- Only there is a relative motion between two bodies
  - Only the body is at rest on a rough surface
  - A body slides over another or tends to do so
  - Normal reaction is zero

**Ans: c. A body slides over another or tends to do so**

4. If  $f_s$  is the static frictional force between two bodies and  $f_k$  is kinetic frictional force between same bodies, then –
- $f_s > f_k$  always
  - $f_s < f_k$  always
  - $f_s = f_k$  always
  - None of these

**Ans: d. None of these**

5. If  $f_{max}$  = the maximum static frictional force between two bodies and  $f_k$  = the kinetic frictional force between same bodies, then –
- $f_{max} = f_k$  always
  - $f_{max} < f_k$
  - $f_{max} > f_k$  always
  - None of these

**Ans: c.  $f_{max} > f_k$  always**

6. The unit of coefficient of static friction is –
- N/m<sup>2</sup>
  - N-m<sup>2</sup>
  - N/m
  - It is unit less.

**Ans: d. It is unit less.**

7. If a body is placed on a rough horizontal surface and the whole system is taken to a gravity free place. If now the body slides over the surface there, then –
- There will be no friction
  - There will be a finite friction
  - It depends upon the nature of the bodies
  - Cannot be predicted

Ans: a. There will be no friction

8. A block of mass 5kg is kept on a rough horizontal surface. What will be the frictional force if a horizontal force of magnitude 36N is applied on the body ? ( $\mu_k = 0.8$ ,  $\mu_s = 0.7$ ,  $g = 10\text{m/s}^2$ )
- 40N
  - 35N
  - 36N
  - 0N

Ans: c. 36N

9. In the above problem, what should be the force needed to displace the block if initially the body is at rest?
- 40 N
  - 35 N
  - 50 N
  - 0 N

Ans: a. 40 N

10. In Q-7, what is the frictional force when the body will be in motion?
- 40 N
  - 35 N
  - 50 N
  - 0 N

Ans: b. 35 N

11. A block of mass 8kg is kept on a rough horizontal surface. What will be the frictional force if a horizontal force of magnitude 65 N is applied on the block ? ( $\mu_k = 0.8$ ,  $\mu_s = 0.7$ ,  $g = 10\text{m/s}^2$ )
- 65 N
  - 64 N
  - 56 N
  - 9 N

Ans: c. 56 N

12. In the above case, what will be the acceleration of the body ?
- $9\text{ m/s}^2$
  - $8\text{ m/s}^2$
  - $\frac{9}{8}\text{ m/s}^2$
  - Zero

Ans: c.  $\frac{9}{8}\text{ m/s}^2$

13. In Q-11, if a horizontal force of magnitude 64 N is applied on the body, then the net force on the block and its acceleration will be –
- 0 N and  $0\text{ m/s}^2$
  - 9 N and  $\frac{9}{8}\text{ m/s}^2$
  - 9 N and  $0\text{ m/s}^2$
  - None of these

Ans: a. 0 N and  $0\text{ m/s}^2$ .

14. When a horizontal force of 45N is applied on a body kept on a rough horizontal plane, it is seen that, the acceleration of the body is  $3 \text{ m/s}^2$ . If the mass of the body is 5kg, then what will be the coefficient of kinetic friction of the system?
- a. 0.8
  - b. 0.7
  - c. 0.6
  - d. 0.5

Ans: c. 0.6

15. In the above problem, what can we predict about the coefficient of static friction of the system ?
- a.  $\mu_s = 0.99$
  - b.  $\mu_s > 0.9$
  - c.  $\mu_s = 0.9$
  - d.  $\mu_s < 0.9$

Ans: d.  $\mu_s < 0.9$

Name of the teacher – Soumitra Maity