

Class – XI

Chapter – Friction

Date - 03.07.20

Topic – Static and Kinetic friction

Choose the correct option for the following questions.

- 1. The kinetic frictional force developed between two surfaces depends on
  - a. The area of contact of two surfaces
  - b. The relative velocity between them
  - c. The normal reaction acting in the contact surface
  - d. All of the above
- 2. For two specific bodies, the constant factor is
  - a. The static frictional force
  - b. The kinetic frictional force
  - c. Both
  - d. None
- 3. Frictional force is present, when
  - a. Only there is a relative motion between two bodies
  - b. Only the body is at rest on a rough surface
  - c. A body slides over another or tends to do so
  - d. Normal reaction is zero
- 4. If  $f_s$  is the static frictional force between two bodies and  $f_k$  is kinetic frictional force between same bodies, then
  - a.  $f_s > f_k$  always
  - b.  $f_s < f_k$  always
  - c.  $f_s = f_k$  always
  - 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
  - a.  $f_{max} = f_k$  always
  - b.  $f_{max} < f_k$
  - c.  $f_{max} > f_k$  always
  - d. None of these
- 6. The unit of coefficient of static friction is
  - a. N/m<sup>2</sup>
  - b. N-m<sup>2</sup>
  - c. N/m
  - d. It is unit less.



 $1 \times 15 = 15$ 

- 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
  - a. There will be no friction
  - b. There will be a finite friction
  - c. It depends upon the nature of the bodies
  - d. Cannot be predicted
- 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 ? ( $\mu_k = 0.8$ ,  $\mu_s = 0.7$ ,  $g = 10m/s^2$ )
  - a. 40N
  - b. 35N
  - c. 36N
  - d. 0N
- 9. In the above problem, what should be the force needed to displace the block if initially the body is at rest?
  - a. 40 N
  - b. 35 N
  - c. 50 N
  - d. 0 N
- 10. In Q-7, what is the frictional force when the body will be in motion?
  - a. 40 N
  - b. 35 N
  - c. 50 N
  - d. 0 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 ? ( $\mu_k = 0.8$ ,  $\mu_s = 0.7$ ,  $g = 10m/s^2$ )
  - a. 65 N
  - b. 64 N
  - c. 56 N
  - d. 9 N

## 12. In the above case, what will be the acceleration of the body ?

- a.  $9 m/s^2$
- b.  $8 m/s^2$
- c.  $\frac{9}{8}m/s^2$
- d. Zero
- 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
  - a. 0 N and 0  $m/s^2$
  - b. 9 N and  $\frac{9}{8} m/s^2$
  - c. 9 N and  $0 m/s^2$
  - d. None of these

- 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  $3 m/s^2$ . 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

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.  $\mu_s < 0.9$

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