17. The limiting value of static friction between two surfaces in contact is
(a) proportional to normal force between the surfaces in contact
(b) independent of area of contact
(c) depends on the microscopic area of constant magnitude
(d) All of the above

18. A mass placed on an inclined plane is just in equilibrium. If $\propto$ is coefficient of friction of the surface, then maximum inclination of the plane with the horizontal is
(a) $\tan^{-1} \propto$ (b) $\tan^{-1} (\propto/2)$
(c) $\sin^{-1} \propto$ (d) $\cos^{-1} \propto$

19. A 30 kg block rests on a rough horizontal surface. A force of 200 N is applied on the block. The block acquires a speed of 4 ms^{-1}, starting from rest in 2 s. What is the value of coefficient of friction?
(a) $\frac{10}{3}$ (b) $\frac{\sqrt{3}}{10}$
(c) 0.47 (d) 0.184

20. A car having a mass of 1000 kg is moving at a speed of 30 ms^{-1}. Brakes are applied to bring the car to rest. If the frictional force between the tyres and the road surface is 5000 N, the car will come to rest in
(a) 5 s (b) 10 s
(c) 12 s (d) 6 s

21. A 100 N force acts horizontally on a block of mass 10 kg placed on a horizontal rough table of coefficient of friction $\propto = 0.5$. If g at the place is 10 ms^{-2}, the acceleration of the block is
(a) zero (b) 10 ms^{-2}
(c) 5 ms^{-2} (d) 5.2 ms^{-2}

22. A block of mass 2 kg is placed on the floor. The coefficient of static friction is 0.4. If a force of 2.8 N is applied on the block parallel to the floor, the force of friction between the block and floor is
(Take, $g = 10$ ms^{-2})
(a) 2.8 N (b) 8 N (c) 2 N (d) zero

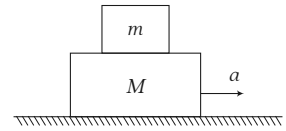
23. A body is projected along a rough horizontal surface with a velocity 6 ms^{-1}. If the body comes to rest after travelling 9 m, then coefficient of sliding friction is (Take, $g = 10$ ms^{-2})
(a) 0.5 (b) 0.4 (c) 0.6 (d) 0.2

24. The coefficient of friction between the tyres and road is 0.4. The minimum distance covered before attaining a speed of 8 ms^{-1} starting from rest is nearly (Take, $g = 10$ ms^{-2})
(a) 8 m (b) 4 m
(c) 10 m (d) 16 m

25. A block is gently placed on a conveyor belt moving horizontally with constant speed. After $t = 4$ s, the velocity of the block becomes equal to the velocity of the belt. If the coefficient of friction between the block and the belt is $\propto = 0.2$, then the velocity of the conveyor belt is
(a) 8 ms^{-1} (b) 4 ms^{-1}
(c) 6 ms^{-1} (d) 18 ms^{-1}

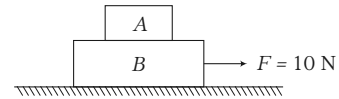
26. The breaking strength of the cable used to pull a body is 40 N. A body of mass 8 kg is resting on a table of coefficient of friction $\propto = 0.2$. The maximum acceleration which can be produced by the cable connected to the body is (Take, $g = 10 ms^{-2}$)
(a) 6 ms^{-2} (b) 3 ms^{-2}
(c) 8 ms^{-2} (d) 8 ms^{-2}

27. A block of mass m is placed on the top of another block of mass M as shown in the figure . The coefficient of friction between them is $\propto$.



The maximum acceleration with which the block M may move, so that m also moves along with it, is
(a) $\propto g$ (b) $\propto \frac{M}{m} g$
(c) $\propto \frac{m}{M} g$ (d) $\frac{g}{\propto}$

28. In the shown arrangement, mass of $A = 1$ kg and mass of $B = 2$ kg. Coefficient of friction between A and $B = 0.2$.



There is no friction between B and ground. The frictional force exerted by A on B equals
(a) 2 N (b) 3 N
(c) 4 N (d) 5 N

29. A block of mass 4 kg is placed on a rough horizontal plane. A time dependent force $F = kt^2$ acts on the block, where $k = 2$ Ns^{-2} and coefficient of friction $\propto = 0.8$.
Force of friction between block and the plane at $t = 2$ s is
(a) 8 N (b) 4 N
(c) 2 N (d) 32 N