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## PHYSICS

# Force and Friction

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1. A 50-kg object is accelerating to the right at  $10 \text{ m/s}^2$ . What is the magnitude of the rightward net force acting on it (in Newtons)? -  **$500 \text{ kgm/s}^2$  ( $f=ma$ )**
2. Force could be a - **push or a pull.**
3. A force arises due to- **the interaction between two objects.**
4. Force has **magnitude as well as direction.**
5. A change in the speed of an object or the direction of its motion or both implies - **a change in its state of motion.**
6. Force acting on an object may cause a change in **its state of motion or a change in its shape.**
8. Force per unit area is called - **pressure.**

9. Liquids and gases exert pressure on **the walls of their containers.**

10. The pressure exerted by air around us is known as **atmospheric pressure.**

11. Friction opposes the relative motion between **two surfaces in contact.** It acts on **both the surfaces.**

12. Friction depends on the nature of **the surfaces in contact.**

13. Static friction comes into play when we try to move **an object at rest.**

14. Sliding friction comes into play when an object is **sliding over one another.**

15. Sliding friction is smaller than **static friction (static friction > kinetic friction > rolling friction)**

16. Friction is important for **many of our activities. (without friction we can't walk)**

17. Friction can be increased by **making a surface rough.**

18. The sole of the shoes and the tyres of the vehicles are **treading to increase friction.**

19. Friction is something **undesirable.**

20. Friction can be reduced by **using lubricants, polishing, proper selection of material.**

21. When one body rolls over another body, rolling friction is **smaller than sliding friction.**

22. In many machines, friction is reduced by **using ball bearings.**

23. Fluid friction can be minimised by giving **suitable shapes to bodies moving in fluids.**

24. the force applied to a cable or wire that is anchored on opposite ends to opposing walls or other objects. This causes a force that pulls equally in both directions- **Tension force**

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25. The spring force is the force created by a compressed or stretched spring.

26. **An** object travels equal distances in equal intervals of time, then it is said to be in uniform motion.

27. if velocity decreases with time, then its acceleration is negative called

**deceleration or retardation.**

28. Acceleration is a **vector quantity** and its SI unit is **ms<sup>-2</sup>**

29. Graphical representation of motion, Displacement and time graph- **Uniform velocity (straight line)**

30. In upward direction, velocity of body is decreasing instead of increasing, then equation of motion –

**1)  $V=U-GT$ , 2)  $S=UT-\frac{1}{2}GT^2$ , 3).  $V^2=U^2-2GS$**

31. If anybody is falling freely under gravity, then acceleration is

- **Positive acceleration due to gravitational force (g)**

32. If an object is thrown vertically upward, then acceleration is – **negative acceleration due to gravitational force (-g)**

33. For a body with zero acceleration or constant speed, graph between velocity and time will be **a straight line parallel to time axis.**

34. For accelerating or decelerating body the graph will be a **straight line inclined to time axis and velocity axis**

35. Graph between position (distance)-time for an accelerating or decelerating body is always **a parabola.**

36. Acceleration-time graph for uniformly accelerating body is a **line parallel to time axis.**

37. In case of uniformly accelerated motion, the graph between **velocity and time** is always **a straight line.**

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38. The motion of a bullet shot from the gun, the motion of a rocket after burning out, the motion of a bomb dropped from an aeroplane are **Projectile Motion.**

39. If we drop a ball from a height and at the same time thrown another ball in a horizontal direction, then both the balls would **strike the earth simultaneously at different places.**

40. Circular motion with a **constant speed** is called **uniform circular motion.**

41. During circular motion an acceleration acts on the body towards the centre, called **centripetal acceleration.**

42. The direction of centripetal acceleration is always towards **the centre of the circular path**

43. SI unit force is **newton (N)** and CGS unit is **dyne**. ( **$1 \text{ N} = 10^{-5} \text{ dyne}$** .)

44. During circular motion a force always acts on the body towards the centre of the circular path, called **centripetal force**. (**centripetal**

$$\text{force} = m \frac{v^2}{r}$$

45. In circular motion we experience that a force is acting on us in opposite to the direction of centripetal force called **centrifugal force**.

46. centrifugal force is an **apparent force or imaginary force and called a pseudo force**.

46. Cyclist inclined itself from vertical to obtain required **centripetal force**

47. For taking turn on a curved road, the frictional forces acting between the tyres of the vehicle and the road acts as **centripetal force**.

48. If a bucket containing water is revolved fast in a vertical plane, the water may not fall even when bucket



is completely inverted because a **centrifugal force**

49. For orbital motion of electrons around the nucleus electrostatic force of attraction is acting between the electrons and the nucleus as **centripetal force.**

50. Cream is separated from milk when it is rotated in a vessel about the same axis-**a centrifugal force**

51. For revolution of the earth around the sun, gravitational force of attraction between the earth and the sun acts as **centripetal force.**

52. A body continues in its state of rest or of uniform motion in a straight line unless an external force act on it. It is based on **law of inertia or law of Galileo.**

53. When a bus or train at rest starts, to move suddenly, the passengers sitting in it jerk in backward direction due to their **inertia of rest.**

54. The dust particles come out from a carpet when it is beaten with a stick due to their **inertia of rest**.

55. A passenger jumping out from a rapidly moving bus or train is advised to jump in forward direction and run forward for a short mile due to **inertia of rest**.

56. When a running bus or train stops suddenly, the passengers sitting in it jerk in forward direction due to **inertia of motion**

57. In Projectile motion, Maximum range  $\theta = 45^\circ$  and maximum height  $\theta = 90^\circ$

58. SI unit of impulse **N-s (or) Kg m/s**

59. Newton's second law of motion-  
Force = **Mass x Acceleration (unit-N)**

60. On firing the bullet, the gunner is pushed in backward direction because of **Newton's third law**

61. A cricketer moves his hands backwards while catching a ball because of **Impulse**

62. A person jumping from a height on a concrete floor receives more injury than when jumping on a spongy floor because of **Impulse.**