1. What is the SI unit of force? [Easy]
2. Define Newton’s First Law of Motion. [Easy]
3. What is the acceleration due to gravity on Earth? [Easy]
4. State Ohm’s Law. [Easy]
5. What are the three types of heat transfer? [Easy]
6. Define the term "velocity." [Easy]
7. What is the formula for work done? [Easy]
8. Name three examples of scalar quantities. [Easy]
9. What is the difference between mass and weight? [Medium]
10. What is the speed of light in a vacuum? [Easy]
11. Explain why astronauts experience weightlessness in space. [Medium]
12. Why does a ball eventually stop rolling on the ground? [Medium]
13. Describe how a simple pendulum works. [Medium]
14. What happens to the resistance of a conductor when its length is doubled? [Medium]
15. Why do metals conduct electricity better than non-metals? [Medium]
16. Explain how a convex lens forms an image. [Medium]
17. Why does sound travel faster in solids than in gases? [Medium]
18. How does increasing the temperature of a gas affect its pressure? [Medium]
19. Why do we see a rainbow after rain? [Medium]
20. What is the principle behind hydraulic brakes? [Medium]
21. A car accelerates uniformly from 10 m/s to 30 m/s in 5 seconds. Find its acceleration. [Medium]
22. A 5 kg object is lifted 10 m above the ground. Find the gravitational potential energy. [Medium]
23. A resistor has a resistance of 10Ω, and a current of 2A flows through it. Calculate the voltage. [Medium]
24. A sound wave has a frequency of 500 Hz and a wavelength of 0.68 m. Find the speed of sound. [Medium]
25. A mirror produces an image that is smaller and inverted. What type of mirror is it? [Medium]
26. A projectile is fired at an angle of 45° with an initial speed of 20 m/s. Find its range. [Hard]
27. Calculate the work done when a force of 15 N moves an object 5 m in the direction of the force. [Medium]
28. A 2 kg block slides down a frictionless incline from a height of 5 m. Find its speed at the bottom. [Medium]
29. A train moving at 40 m/s applies brakes and stops in 10 seconds. Find the acceleration. [Medium]
30. A capacitor of 5µF is connected to a 12V battery. Find the charge stored in it. [Medium]
31. Compare the properties of transverse and longitudinal waves. [Medium]
32. How does the kinetic energy of a gas molecule change with temperature? [Medium]
33. Analyze the effect of increasing resistance in a parallel circuit. [Hard]
34. How does the moment of inertia affect the rotational motion of an object? [Hard]
35. Compare the efficiency of a heat engine at different temperatures. [Hard]
36. A ball is thrown vertically upward. Analyze its velocity and acceleration at different points in motion. [Medium]
37. How do the factors affecting friction vary in different situations? [Hard]
38. How does the refractive index affect the bending of light? [Medium]
39. Why does an electric current produce a magnetic field around a conductor? [Medium]
40. How does increasing altitude affect air pressure and density? [Medium]
41. A satellite is orbiting Earth. Justify whether it is in free fall. [Hard]
42. Evaluate the advantages and disadvantages of nuclear energy. [Hard]
43. Determine if a machine that outputs 500J of work for 700J of input is efficient. [Hard]
44. A ball dropped from a height of 10 m bounces back to 8 m. Evaluate the energy lost. [Hard]
45. Analyze whether solar panels are a viable energy source for spacecraft. [Hard]
46. Design an experiment to measure the acceleration due to gravity using a pendulum. [Hard]
47. Propose a method to increase the efficiency of an internal combustion engine. [Hard]
48. Devise a simple model to explain the photoelectric effect. [Hard]
49. Create a working prototype for a simple wind-powered generator. [Hard]
50. Develop an alternative energy source that could replace fossil fuels. [Hard]
51. What is the force required to accelerate a 10 kg object at 5 m/s²? [Easy]
52. Why do astronauts need special suits in space? [Medium]
53. If two bulbs are connected in series, how does their brightness compare to when connected in parallel? [Medium]
54. Why does ice float on water? [Medium]
55. What happens to the frequency of light when it moves from air to water? [Medium]
56. A transformer has 100 turns on the primary coil and 500 on the secondary. What is the voltage transformation ratio? [Hard]
57. Explain why objects appear red under red light but black under green light. [Hard]
58. What happens if an object is placed at the focal point of a concave mirror? [Medium]
59. How does an increase in humidity affect the speed of sound? [Hard]
60. Devise a method to measure the density of an irregularly shaped object. [Hard]