

AP Physics 1 Practice Test 6

60 original multiple-choice questions covering all 8 AP Physics 1 units. Choose one answer for each question. The full answer key is on the last page — worked explanations for every question are free on the test page at QuaidianPoint.com.

Name: _____ Class: _____ Score: _____ / 60

Unit 1: Kinematics

Q1. A school bus starts at 4 m/s and accelerates uniformly at 2 m/s^2 for 4 s. How far does it travel in that time?

- (A) 16
- (B) 32
- (C) 48
- (D) 42

Q2. A rubber ball is dropped from rest from a bridge 78.4 m above the water. Ignoring air resistance, how long does it take to reach the water?

- (A) 5
- (B) 3.5
- (C) 8
- (D) 4

Q3. A beanbag is thrown straight upward at 21 m/s. Ignoring air resistance, what is its maximum height above the release point?

- (A) 22.5
- (B) 45
- (C) 11.25
- (D) 31.83

Q4. A tram travelling at 30 m/s brakes uniformly at 4 m/s^2 . What is its stopping distance?

- (A) 225
- (B) 56.25
- (C) 112.5
- (D) 120

Q5. A golf ball rolls off a horizontal table 44.1 m high with a horizontal speed of 10 m/s. Ignoring air resistance, how far from the base of the table does it land?

- (A) 441
- (B) 15
- (C) 30
- (D) 13

Q6. A train moving at 10 m/s accelerates at 2 m/s^2 for 6 s. What is its final speed?

- (A) 22
- (B) 16
- (C) 120
- (D) 20

Q7. A delivery rider covers 100 m in 10 s and then 90 m in 30 s. What is the average speed for the whole trip?

- (A) 6.5
- (B) 5.75
- (C) 10
- (D) 4.75

Unit 2: Force and Translational Dynamics

Q8. A net force accelerates a 5 kg sled at 4 m/s^2 on a frictionless surface. What is the magnitude of the net force?

- (A) 9
- (B) 20
- (C) 10
- (D) 25

Q9. A 25 kg wooden crate slides on a horizontal floor with coefficient of kinetic friction 0.2. What is the kinetic friction force?

- (A) 49
- (B) 5
- (C) 245
- (D) 24.5

Q10. A 5 kg sled rests on a frictionless incline at 30° to the horizontal. What is the component of its weight parallel to the incline?

- (A) 49
- (B) 42.44
- (C) 24.5
- (D) 12.25

Q11. A person of mass 90 kg stands in a lift accelerating upward at 1.5 m/s^2 . What is the normal force on the person?

- (A) 882
- (B) 747
- (C) 1117
- (D) 1017

Q12. Two blocks of masses 3 kg and 8 kg are pushed together on a frictionless surface by a 48 N horizontal force. What is the acceleration of the pair?

- (A) 16
- (B) 4.36
- (C) 6
- (D) 8.73

Q13. A 60 N horizontal force pulls a 5 kg crate while kinetic friction of 10 N opposes the motion. What is the acceleration?

- (A) 12
- (B) 10
- (C) 2
- (D) 14.7

Q14. A 2 kg satellite model moves in a horizontal circle of radius 5 m at 10 m/s. What is the centripetal force on it?

- (A) 4
- (B) 200
- (C) 20
- (D) 40

Unit 3: Work, Energy, and Power

Q15. A force of 20 N at 0° to the horizontal pushes an object 10 m along the floor. How much work does the force do?

- (A) 200
- (B) 250
- (C) 100
- (D) 275

Q16. What is the kinetic energy of a 4 kg cart moving at 10 m/s?

- (A) 400
- (B) 20
- (C) 200
- (D) 100

Q17. What is the gravitational potential energy of a 10 kg brick held 6 m above the ground, relative to the ground?

- (A) 60
- (B) 98
- (C) 588
- (D) 294

Q18. A motor does 400 J of work in 10 s. What is its average power output?

- (A) 40
- (B) 4000
- (C) 20
- (D) 60

Q19. A 4 kg sled moving at 5 m/s receives 90 J of net work on a frictionless surface. What is its final speed?

- (A) 27.5
- (B) 6.71
- (C) 9.37
- (D) 8.37

Q20. A spring of constant 50 N/m is compressed by 0.1 m. How much elastic potential energy is stored?

- (A) 5
- (B) 0.25
- (C) 2.5
- (D) 0.5

Q21. A worker lifts a 50 kg load through a height of 10 m in 5 s at constant speed. What is the average power delivered?

- (A) 980
- (B) 4900
- (C) 490
- (D) 100

Unit 4: Linear Momentum

Q22. What is the magnitude of the momentum of a 3 kg bowling ball moving at 4 m/s?

- (A) 7
- (B) 6
- (C) 12
- (D) 24

Q23. A constant force of 50 N acts on a 2 kg object moving at 10 m/s in the opposite direction until it stops. For how long does the force act?

- (A) 1000
- (B) 0.8
- (C) 0.2
- (D) 0.4

Q24. A 3 kg cart moving at 6 m/s collides with and sticks to a stationary 6 kg cart on a frictionless track. What is their common speed after the collision?

- (A) 6
- (B) 2
- (C) 3
- (D) 4

Q25. A 1 kg projectile is fired at 20 m/s from a stationary launcher of mass 10 kg on a frictionless surface. What is the recoil speed of the launcher?

- (A) 20
- (B) 2
- (C) 4
- (D) 3.74

Q26. A 0.1 kg ball hits a wall at 15 m/s and rebounds at 5 m/s in the opposite direction. What is the magnitude of the impulse on the ball?

- (A) 1.5
- (B) 0.5
- (C) 1
- (D) 2

Q27. An object at rest on a frictionless surface splits into a 6 kg part moving at 5 m/s and a 2 kg part. What is the speed of the 2 kg part?

- (A) 15
- (B) 5
- (C) 30
- (D) 7.5

Q28. A 2 kg object changes speed by 15 m/s in 2 s under a constant net force. What is the magnitude of that force?

- (A) 30
- (B) 60
- (C) 15
- (D) 7.5

Unit 5: Torque and Rotational Dynamics

Q29. A force of 50 N acts perpendicular to a door handle at a distance of 0.5 m from the pivot. What is the torque about the pivot?

- (A) 100
- (B) 50.5
- (C) 25
- (D) 12.5

Q30. A net torque of 12 N m acts on an object with moment of inertia 2 kg m^2 . What is its angular acceleration?

- (A) 6
- (B) 24
- (C) 3
- (D) 7

Q31. A disk starts with angular speed 4 rad/s and accelerates uniformly at 3 rad/s^2 for 3 s. What is its final angular speed?

- (A) 7
- (B) 36
- (C) 10
- (D) 13

Q32. A flywheel with initial angular speed 2 rad/s undergoes angular acceleration 2 rad/s^2 for 5 s. Through what angle does it rotate?

- (A) 60
- (B) 35
- (C) 10
- (D) 17.5

Q33. What is the moment of inertia of a 4 kg point mass at a distance of 0.4 m from the rotation axis?

- (A) 0.64
- (B) 1.6
- (C) 4.4
- (D) 1.28

Q34. A seesaw is balanced when a 40 N force acts 0.5 m from the pivot on one side. What force must act 2 m from the pivot on the other side to keep it balanced?

- (A) 40
- (B) 160
- (C) 10
- (D) 20

Q35. A solid disk of mass 2 kg and radius 0.3 m experiences a net torque of 8 N m. What is its angular acceleration? (Disk: $I = (1/2)MR^2$.)

- (A) 4
- (B) 13.33
- (C) 44.44
- (D) 88.89

Q36. A grindstone with initial angular speed 3 rad/s accelerates at 4 rad/s² through an angle of 6 rad. What is its final angular speed?

- (A) 27
- (B) 7.55
- (C) 6.93
- (D) 8.55

Unit 6: Energy and Momentum of Rotating Systems

Q37. What is the rotational kinetic energy of an object with moment of inertia 3 kg m² rotating at 3 rad/s?

- (A) 27
- (B) 13.5
- (C) 4.5
- (D) 19.5

Q38. What is the angular momentum of a rotating body with moment of inertia 3 kg m² and angular speed 4 rad/s?

- (A) 0.75
- (B) 48
- (C) 6
- (D) 12

Q39. A skater spins with moment of inertia 2 kg m² at 8 rad/s, then changes shape so the moment of inertia becomes 8 kg m². With no external torque, what is the new angular speed?

- (A) 2
- (B) 8
- (C) 32
- (D) 4

Q40. A solid sphere of mass 2 kg rolls without slipping at 4 m/s. What is its total kinetic energy? (Sphere: $I = (2/5)MR^2$.)

- (A) 16
- (B) 32
- (C) 22.4
- (D) 11.2

Q41. A solid disk of mass 6 kg and radius 0.3 m spins at 4 rad/s. What is its rotational kinetic energy? (Disk: $I = (1/2)MR^2$.)

- (A) 7.2
- (B) 48
- (C) 2.16
- (D) 4.32

Q42. A 2 kg ball moves at 5 m/s at a perpendicular distance of 0.5 m from a point. What is its angular momentum about that point?

- (A) 5
- (B) 10
- (C) 1
- (D) 2.5

Q43. A turntable with moment of inertia 5 kg m^2 rotates at 4 rad/s. A stationary object is dropped onto it, raising the total moment of inertia to 10 kg m^2 . What is the new angular speed if no external torque acts?

- (A) 4
- (B) 8
- (C) 3
- (D) 2

Q44. A solid cylinder of mass 8 kg rolls without slipping at 3 m/s. What is its total kinetic energy? (Cylinder: $I = (1/2)MR^2$.)

- (A) 36
- (B) 54
- (C) 72
- (D) 108

Unit 7: Oscillations

Q45. A 1 kg mass on a spring of constant 400 N/m oscillates on a frictionless surface. What is the period of oscillation? (Use $\pi = 3.14$.)

- (A) 0.31
- (B) 125.6
- (C) 0.16
- (D) 0.63

Q46. What is the period of a simple pendulum with a brass bob and length 1.44 m on Earth? (Use $\pi = 3.14$, $g = 9.8 \text{ m/s}^2$.)

- (A) 16.38
- (B) 1.2
- (C) 2.41
- (D) 4.3

Q47. An pendulum completes one oscillation in 2 s. What is its frequency?

- (A) 2
- (B) 3.14
- (C) 1
- (D) 0.5

Q48. A mass of 2 kg on a spring ($k = 100 \text{ N/m}$) oscillates with amplitude 0.1 m. What is its maximum speed?

- (A) 0.07
- (B) 0.71
- (C) 5
- (D) 1.41

Q49. A mass of 1 kg on a spring ($k = 400 \text{ N/m}$) oscillates with amplitude 0.2 m. What is its maximum acceleration?

- (A) 4
- (B) 80
- (C) 40
- (D) 110.6

Q50. What is the total mechanical energy of a spring oscillator with $k = 400 \text{ N/m}$ and amplitude 0.1 m?

- (A) 40
- (B) 20
- (C) 4
- (D) 2

Q51. A simple pendulum has a period of 1.5 s on Earth. What is its length? (Use $\pi = 3.14$, $g = 9.8 \text{ m/s}^2$.)

- (A) 0.56
- (B) 1.76
- (C) 22.05
- (D) 1.12

Q52. A 4 kg mass oscillates on a spring with period 1 s. What is the spring constant? (Use $\pi = 3.14$.)

- (A) 4
- (B) 50.24
- (C) 157.75
- (D) 78.88

Unit 8: Fluids

Q53. A force of 50 N acts uniformly over an area of 0.25 m^2 . What is the pressure?

- (A) 12.5
- (B) 50.25
- (C) 200
- (D) 400

Q54. What is the gauge pressure at a depth of 5 m in water of density 1000 kg/m^3 ? ($g = 9.8 \text{ m/s}^2$.)

- (A) 49000
- (B) 5000
- (C) 9800
- (D) 24500

Q55. A box of volume 0.02 m^3 is fully submerged in water (density 1000 kg/m^3). What is the buoyant force on it?

- (A) 20
- (B) 0.2
- (C) 98
- (D) 196

Q56. Water flows at 3 m/s through a pipe of cross-sectional area 0.04 m^2 , then enters a narrower section of area 0.02 m^2 . What is the speed in the narrower section?

- (A) 3
- (B) 6
- (C) 1.5
- (D) 9.22

Q57. Water flows through a pipe of area 0.01 m^2 at 2 m/s. What is the volume flow rate?

- (A) 0.02
- (B) 2.01
- (C) 0.01
- (D) 0.04

Q58. In a horizontal pipe, water speeds up from 2 m/s to 6 m/s. By how much does the pressure decrease? (Density of water = 1000 kg/m^3 .)

- (A) 4000
- (B) 2000
- (C) 16000
- (D) 8000

Q59. What is the absolute pressure at a depth of 20 m in water? (Atmospheric pressure = 101000 Pa , density of water = 1000 kg/m^3 , $g = 9.8 \text{ m/s}^2$.)

- (A) 196000
- (B) 121000
- (C) 296000
- (D) 297000

Q60. A metal sample has mass 80 kg and volume 0.05 m^3 . What is its density?

- (A) 4
- (B) 1600
- (C) 0
- (D) 800

Answer Key

Q1: B	Q11: D	Q21: A	Q31: D	Q41: C	Q51: A
Q2: D	Q12: B	Q22: C	Q32: B	Q42: A	Q52: C
Q3: A	Q13: B	Q23: D	Q33: A	Q43: D	Q53: C
Q4: C	Q14: D	Q24: B	Q34: C	Q44: B	Q54: A
Q5: C	Q15: A	Q25: B	Q35: D	Q45: A	Q55: D
Q6: A	Q16: C	Q26: D	Q36: B	Q46: C	Q56: B
Q7: D	Q17: C	Q27: A	Q37: B	Q47: D	Q57: A
Q8: B	Q18: A	Q28: C	Q38: D	Q48: B	Q58: C
Q9: A	Q19: D	Q29: C	Q39: A	Q49: B	Q59: D

Q10: C	Q20: B	Q30: A	Q40: C	Q50: D	Q60: B
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