

AP Physics 1 Practice Test 10

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 10 m/s and accelerates uniformly at 2 m/s^2 for 4 s. How far does it travel in that time?

- (A) 40
- (B) 56
- (C) 72
- (D) 66

Q2. A tennis ball is dropped from rest from a bridge 19.6 m above the water. Ignoring air resistance, how long does it take to reach the water?

- (A) 3
- (B) 1.5
- (C) 4
- (D) 2

Q3. A softball is thrown straight upward at 28 m/s. Ignoring air resistance, what is its maximum height above the release point?

- (A) 40
- (B) 80
- (C) 20
- (D) 55.8

Q4. A motorcycle travelling at 20 m/s brakes uniformly at 5 m/s^2 . What is its stopping distance?

- (A) 80
- (B) 20
- (C) 40
- (D) 100

Q5. A golf ball rolls off a horizontal table 19.6 m high with a horizontal speed of 12 m/s. Ignoring air resistance, how far from the base of the table does it land?

- (A) 235.2
- (B) 12
- (C) 24
- (D) 14

Q6. A bus moving at 5 m/s accelerates at 1 m/s^2 for 6 s. What is its final speed?

- (A) 11
- (B) 30
- (C) 10
- (D) 16.07

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

- (A) 10.5
- (B) 10
- (C) 14.02
- (D) 9.5

Unit 2: Force and Translational Dynamics

Q8. A net force accelerates a 8 kg crate at 3 m/s^2 on a frictionless surface. What is the magnitude of the net force?

- (A) 11
- (B) 24
- (C) 12
- (D) 32

Q9. A 20 kg metal toolbox slides on a horizontal floor with coefficient of kinetic friction 0.4. What is the kinetic friction force?

- (A) 78.4
- (B) 8
- (C) 196
- (D) 39.2

Q10. A 5 kg sled rests on a frictionless incline at 37° to the horizontal. What is the component of its weight parallel to the incline?

- (A) 49
- (B) 39.13
- (C) 29.49
- (D) 14.74

Q11. A person of mass 60 kg stands in a lift accelerating upward at 1 m/s^2 . What is the normal force on the person?

- (A) 588
- (B) 528
- (C) 748
- (D) 648

Q12. Two blocks of masses 4 kg and 6 kg are pushed together on a frictionless surface by a 27 N horizontal force. What is the acceleration of the pair?

- (A) 6.75
- (B) 2.7
- (C) 4.5
- (D) 5.4

Q13. A 80 N horizontal force pulls a 10 kg crate while kinetic friction of 10 N opposes the motion. What is the acceleration?

- (A) 8
- (B) 7
- (C) 1
- (D) 9

Q14. A 4 kg cyclist moves in a horizontal circle of radius 2 m at 6 m/s. What is the centripetal force on it?

- (A) 12
- (B) 144
- (C) 36
- (D) 72

Unit 3: Work, Energy, and Power

Q15. A force of 30 N at 60° to the horizontal pushes an object 5 m along the floor. How much work does the force do?

- (A) 75
- (B) 150
- (C) 125
- (D) 103.75

Q16. A 4.0 kg box is lifted vertically through 2.5 m at constant speed. How much work is done by the lifting force?

- (A) 10 J
- (B) 39 J
- (C) 98 J
- (D) 245 J

Q17. What is the gravitational potential energy of a 5 kg brick held 6 m above the ground, relative to the ground?

- (A) 30
- (B) 49
- (C) 294
- (D) 147

Q18. A motor does 800 J of work in 10 s. What is its average power output?

- (A) 80
- (B) 8000
- (C) 40
- (D) 100

Q19. A 2 kg sled moving at 5 m/s receives 40 J of net work on a frictionless surface. What is its final speed?

- (A) 25
- (B) 6.32
- (C) 9.06
- (D) 8.06

Q20. A spring of constant 150 N/m is compressed by 0.2 m. How much elastic potential energy is stored?

- (A) 30
- (B) 3
- (C) 15
- (D) 6

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

- (A) 490
- (B) 4900
- (C) 245
- (D) 50

Unit 4: Linear Momentum

Q22. What is the magnitude of the momentum of a 5 kg hockey puck moving at 4 m/s?

- (A) 9
- (B) 10
- (C) 20
- (D) 40

Q23. A constant force of 20 N acts on a 5 kg object moving at 10 m/s in the opposite direction until it stops. For how long does the force act?

- (A) 1000
- (B) 5
- (C) 1.25
- (D) 2.5

Q24. A 3 kg cart moving at 8 m/s collides with and sticks to a stationary 4 kg cart on a frictionless track. What is their common speed after the collision?

- (A) 8
- (B) 3.43
- (C) 6
- (D) 6.86

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

- (A) 10
- (B) 1
- (C) 2
- (D) 2.37

Q26. A 0.2 kg ball hits a wall at 25 m/s and rebounds at 5 m/s in the opposite direction. What is the magnitude of the impulse on the ball?

- (A) 5
- (B) 1
- (C) 3
- (D) 6

Q27. An object at rest on a frictionless surface splits into a 4 kg part moving at 10 m/s and a 2 kg part. What is the speed of the 2 kg part?

- (A) 20
- (B) 10
- (C) 40
- (D) 28.4

Q28. A 4 kg object changes speed by 10 m/s in 5 s under a constant net force. What is the magnitude of that force?

- (A) 40
- (B) 200
- (C) 8
- (D) 4

Unit 5: Torque and Rotational Dynamics

Q29. A force of 50 N acts perpendicular to a lever at a distance of 1.2 m from the pivot. What is the torque about the pivot?

- (A) 41.67
- (B) 51.2
- (C) 60
- (D) 30

Q30. A net torque of 24 N m acts on an object with moment of inertia 4 kg m². What is its angular acceleration?

- (A) 6
- (B) 96
- (C) 3
- (D) 7

Q31. A fan blade starts with angular speed 2 rad/s and accelerates uniformly at 3 rad/s² for 4 s. What is its final angular speed?

- (A) 6
- (B) 24
- (C) 11
- (D) 14

Q32. A flywheel with initial angular speed 2 rad/s undergoes angular acceleration 4 rad/s² for 3 s. Through what angle does it rotate?

- (A) 42
- (B) 24
- (C) 12
- (D) 33.88

Q33. What is the moment of inertia of a 2 kg point mass at a distance of 0.4 m from the rotation axis?

- (A) 0.32
- (B) 0.8
- (C) 2.4
- (D) 0.64

Q34. A seesaw is balanced when a 60 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) 60
- (B) 240
- (C) 15
- (D) 30

Q35. A solid disk of mass 4 kg and radius 0.4 m experiences a net torque of 8 N m. What is its angular acceleration? (Disk: $I = (1/2)MR^2$.)

- (A) 2
- (B) 5
- (C) 12.5
- (D) 25

Q36. A wheel with initial angular speed 2 rad/s accelerates at 2 rad/s² through an angle of 6 rad. What is its final angular speed?

- (A) 14
- (B) 5.29
- (C) 4.9
- (D) 6.29

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 5 rad/s?

- (A) 75
- (B) 37.5
- (C) 7.5
- (D) 52.38

Q38. What is the angular momentum of a rotating body with moment of inertia 2 kg m² and angular speed 3 rad/s?

- (A) 0.67
- (B) 18
- (C) 3
- (D) 6

Q39. A skater spins with moment of inertia 4 kg m² at 6 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) 3
- (B) 6
- (C) 12
- (D) 5.11

Q40. A solid sphere of mass 5 kg rolls without slipping at 6 m/s. What is its total kinetic energy? (Sphere: $I = (2/5)MR^2$.)

- (A) 90
- (B) 180
- (C) 126
- (D) 63

Q41. A solid disk of mass 6 kg and radius 0.5 m spins at 4 rad/s. What is its rotational kinetic energy? (Disk: $I = (1/2)MR^2$.)

- (A) 12
- (B) 48
- (C) 6
- (D) 9.22

Q42. A 1 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) 2.5
- (B) 5
- (C) 0.5
- (D) 1.25

Q43. A turntable with moment of inertia 5 kg m^2 rotates at 6 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) 6
- (B) 12
- (C) 4
- (D) 3

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

- (A) 16
- (B) 24
- (C) 32
- (D) 48

Unit 7: Oscillations

Q45. A 4 kg mass on a spring of constant 200 N/m oscillates on a frictionless surface. What is the period of oscillation? (Use $\pi = 3.14$.)

- (A) 0.89
- (B) 44.41
- (C) 0.44
- (D) 1.78

Q46. What is the period of a simple pendulum with a steel bob and length 0.49 m on Earth? (Use $\pi = 3.14$, $g = 9.8 \text{ m/s}^2$.)

- (A) 28.09
- (B) 0.7
- (C) 1.4
- (D) 2.92

Q47. An pendulum completes one oscillation in 0.5 s. What is its frequency?

- (A) 0.5
- (B) 12.56
- (C) 4
- (D) 2

Q48. A mass of 1 kg on a spring ($k = 100 \text{ N/m}$) oscillates with amplitude 0.1 m. What is its maximum speed?

- (A) 0.1
- (B) 1
- (C) 10
- (D) 2

Q49. A mass of 4 kg on a spring ($k = 400 \text{ N/m}$) oscillates with amplitude 0.2 m. What is its maximum acceleration?

- (A) 2
- (B) 20
- (C) 80
- (D) 10

Q50. What is the total mechanical energy of a spring oscillator with $k = 400 \text{ N/m}$ and amplitude 0.2 m?

- (A) 80
- (B) 40
- (C) 16
- (D) 8

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

- (A) 0.99
- (B) 3.12
- (C) 39.2
- (D) 1.99

Q52. A 2 kg mass oscillates on a spring with period 0.5 s. What is the spring constant? (Use $\pi = 3.14$.)

- (A) 8
- (B) 50.24
- (C) 315.51
- (D) 157.75

Unit 8: Fluids

Q53. A force of 150 N acts uniformly over an area of 2 m^2 . What is the pressure?

- (A) 300
- (B) 152
- (C) 75
- (D) 150

Q54. What is the gauge pressure at a depth of 15 m in oil of density 1200 kg/m^3 ? ($g = 9.8 \text{ m/s}^2$.)

- (A) 176400
- (B) 18000
- (C) 11760
- (D) 88200

Q55. A stone of volume 0.05 m^3 is fully submerged in water (density 1000 kg/m^3). What is the buoyant force on it?

- (A) 50
- (B) 0.49
- (C) 245
- (D) 490

Q56. Water flows at 2 m/s through a pipe of cross-sectional area 0.08 m^2 , then enters a narrower section of area 0.04 m^2 . What is the speed in the narrower section?

- (A) 2
- (B) 4
- (C) 1
- (D) 6.48

Q57. Water flows through a pipe of area 0.01 m^2 at 4 m/s. What is the volume flow rate?

- (A) 0.04
- (B) 4.01
- (C) 0
- (D) 0.08

Q58. In a horizontal pipe, water speeds up from 3 m/s to 5 m/s. By how much does the pressure decrease? (Density of water = 1000 kg/m^3 .)

- (A) 2000
- (B) 1000
- (C) 8000
- (D) 4000

Q59. What is the absolute pressure at a depth of 10 m in water? (Atmospheric pressure = 101000 Pa , density of water = 1000 kg/m^3 , $g = 9.8 \text{ m/s}^2$.)

- (A) 98000
- (B) 111000
- (C) 198000
- (D) 199000

Q60. A alloy block has mass 40 kg and volume 0.05 m^3 . What is its density?

- (A) 2
- (B) 800
- (C) 0
- (D) 400

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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