

AP Physics 1 Practice Test 7

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 cyclist starts at 8 m/s and accelerates uniformly at 3 m/s^2 for 5 s. How far does it travel in that time?

- (A) 40
- (B) 115
- (C) 77.5
- (D) 87.5

Q2. A rubber 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) 2
- (D) 4

Q3. A beanbag 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 truck travelling at 24 m/s brakes uniformly at 4 m/s^2 . What is its stopping distance?

- (A) 144
- (B) 36
- (C) 96
- (D) 72

Q5. A bearing rolls off a horizontal table 44.1 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) 529.2
- (B) 36
- (C) 18
- (D) 15

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

- (A) 17
- (B) 11
- (C) 60
- (D) 15

Q7. A jogger covers 60 m in 10 s and then 90 m in 30 s. What is the average speed for the whole trip?

- (A) 4.5
- (B) 4.75
- (C) 3.75
- (D) 6

Unit 2: Force and Translational Dynamics

Q8. A net force accelerates a 10 kg cart at 3 m/s^2 on a frictionless surface. What is the magnitude of the net force?

- (A) 13
- (B) 15
- (C) 40
- (D) 30

Q9. A 10 kg wooden crate slides on a horizontal floor with coefficient of kinetic friction 0.4. What is the kinetic friction force?

- (A) 4
- (B) 39.2
- (C) 98
- (D) 19.6

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

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

Q11. A person of mass 70 kg stands in a lift accelerating upward at 1.5 m/s^2 . What is the normal force on the person?

- (A) 686
- (B) 581
- (C) 891
- (D) 791

Q12. Two blocks of masses 3 kg and 8 kg are pushed together on a frictionless surface by a 36 N horizontal force. What is the acceleration of the pair?

- (A) 3.27
- (B) 12
- (C) 4.5
- (D) 6.55

Q13. A 80 N horizontal force pulls a 10 kg crate while kinetic friction of 20 N opposes the motion. What is the acceleration?

- (A) 8
- (B) 2
- (C) 6
- (D) 9.22

Q14. A 4 kg satellite model moves in a horizontal circle of radius 5 m at 6 m/s. What is the centripetal force on it?

- (A) 4.8
- (B) 144
- (C) 28.8
- (D) 14.4

Unit 3: Work, Energy, and Power

Q15. A force of 40 N at 60° to the horizontal pushes an object 10 m along the floor. How much work does the force do?

- (A) 200
- (B) 400
- (C) 250
- (D) 275

Q16. What is the kinetic energy of a 4 kg puck moving at 6 m/s?

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

Q17. What is the gravitational potential energy of a 3 kg brick held 10 m above the ground, relative to the ground?

- (A) 30
- (B) 294
- (C) 29.4
- (D) 147

Q18. A motor does 1200 J of work in 4 s. What is its average power output?

- (A) 300
- (B) 4800
- (C) 150
- (D) 320

Q19. A 2 kg cart moving at 5 m/s receives 90 J of net work on a frictionless surface. What is its final speed?

- (A) 50
- (B) 9.49
- (C) 10.72
- (D) 11.72

Q20. A spring of constant 200 N/m is compressed by 0.4 m. How much elastic potential energy is stored?

- (A) 80
- (B) 40
- (C) 32
- (D) 16

Q21. A worker lifts a 20 kg load through a height of 5 m in 5 s at constant speed. What is the average power delivered?

- (A) 980
- (B) 196
- (C) 98
- (D) 20

Unit 4: Linear Momentum

Q22. What is the magnitude of the momentum of a 3 kg hockey puck moving at 6 m/s?

- (A) 9
- (B) 18
- (C) 36
- (D) 25.66

Q23. A constant force of 50 N acts on a 2 kg object moving at 8 m/s in the opposite direction until it stops. For how long does the force act?

- (A) 800
- (B) 0.64
- (C) 0.16
- (D) 0.32

Q24. A 2 kg cart moving at 8 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) 2
- (B) 8
- (C) 2.67
- (D) 4

Q25. A 1 kg projectile is fired at 10 m/s from a stationary launcher of mass 5 kg on a frictionless surface. What is the recoil speed of the launcher?

- (A) 10
- (B) 4
- (C) 2
- (D) 3.74

Q26. A 0.1 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) 2.5
- (B) 0.5
- (C) 3
- (D) 1.5

Q27. An object at rest on a frictionless surface splits into a 6 kg part moving at 10 m/s and a 3 kg part. What is the speed of the 3 kg part?

- (A) 20
- (B) 10
- (C) 60
- (D) 28.4

Q28. A 2 kg object changes speed by 15 m/s in 5 s under a constant net force. What is the magnitude of that force?

- (A) 30
- (B) 150
- (C) 3
- (D) 6

Unit 5: Torque and Rotational Dynamics

Q29. A force of 30 N acts perpendicular to a lever at a distance of 0.5 m from the pivot. What is the torque about the pivot?

- (A) 60
- (B) 15
- (C) 30.5
- (D) 7.5

Q30. A net torque of 8 N m acts on an object with moment of inertia 8 kg m^2 . What is its angular acceleration?

- (A) 1
- (B) 64
- (C) 0.5
- (D) 2

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

- (A) 5
- (B) 18
- (C) 11
- (D) 8

Q32. A merry-go-round with initial angular speed 0 rad/s undergoes angular acceleration 4 rad/s^2 for 5 s. Through what angle does it rotate?

- (A) 100
- (B) 20
- (C) 25
- (D) 50

Q33. What is the moment of inertia of a 3 kg point mass at a distance of 1 m from the rotation axis?

- (A) 4
- (B) 3
- (C) 6
- (D) 5.11

Q34. A seesaw is balanced when a 60 N force acts 1 m from the pivot on one side. What force must act 1.5 m from the pivot on the other side to keep it balanced?

- (A) 60
- (B) 40
- (C) 90
- (D) 80

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

- (A) 0.25
- (B) 0.83
- (C) 2.78
- (D) 5.56

Q36. A wheel with initial angular speed 2 rad/s accelerates at 4 rad/s² through an angle of 6 rad. What is its final angular speed?

- (A) 7.21
- (B) 26
- (C) 6.93
- (D) 8.21

Unit 6: Energy and Momentum of Rotating Systems

Q37. What is the rotational kinetic energy of an object with moment of inertia 2 kg m² rotating at 5 rad/s?

- (A) 50
- (B) 5
- (C) 25
- (D) 35.25

Q38. What is the angular momentum of a rotating body with moment of inertia 6 kg m² and angular speed 4 rad/s?

- (A) 1.5
- (B) 96
- (C) 24
- (D) 12

Q39. A skater spins with moment of inertia 2 kg m² at 6 rad/s, then changes shape so the moment of inertia becomes 4 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 10 kg rolls without slipping at 3 m/s. What is its total kinetic energy? (Sphere: $I = (2/5)MR^2$.)

- (A) 45
- (B) 90
- (C) 31.5
- (D) 63

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

- (A) 8
- (B) 4
- (C) 32
- (D) 6.48

Q42. A 1 kg ball moves at 10 m/s at a perpendicular distance of 2 m from a point. What is its angular momentum about that point?

- (A) 20
- (B) 10
- (C) 2
- (D) 28.4

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 6 kg m^2 . What is the new angular speed if no external torque acts?

- (A) 6
- (B) 7.2
- (C) 5
- (D) 7.85

Q44. A solid cylinder of mass 2 kg rolls without slipping at 4 m/s. What is its total kinetic energy? (Cylinder: $I = (1/2)MR^2$.)

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

Unit 7: Oscillations

Q45. A 2 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) 88.81
- (B) 0.44
- (C) 0.22
- (D) 0.89

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

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

Q47. An oscillating mass 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 0.2 m. What is its maximum speed?

- (A) 2
- (B) 0.4
- (C) 20
- (D) 4

Q49. A mass of 4 kg on a spring ($k = 100 \text{ N/m}$) oscillates with amplitude 0.2 m. What is its maximum acceleration?

- (A) 1
- (B) 20
- (C) 5
- (D) 2.5

Q50. What is the total mechanical energy of a spring oscillator with $k = 50 \text{ N/m}$ and amplitude 0.3 m?

- (A) 15
- (B) 7.5
- (C) 2.25
- (D) 4.5

Q51. A simple pendulum has a period of 0.5 s on Earth. What is its length? (Use $\pi = 3.14$, $g = 9.8 \text{ m/s}^2$.)

- (A) 0.06
- (B) 0.2
- (C) 2.45
- (D) 0.12

Q52. A 1 kg mass oscillates on a spring with period 2 s. What is the spring constant? (Use $\pi = 3.14$.)

- (A) 0.25
- (B) 6.28
- (C) 4.93
- (D) 9.86

Unit 8: Fluids

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

- (A) 100
- (B) 25
- (C) 52
- (D) 50

Q54. What is the gauge pressure at a depth of 4 m in oil of density 1200 kg/m^3 ? ($g = 9.8 \text{ m/s}^2$.)

- (A) 47040
- (B) 4800
- (C) 11760
- (D) 23520

Q55. A box 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) 490
- (D) 245

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 0.04 m^2 . What is the speed in the narrower section?

- (A) 1.5
- (B) 5.11
- (C) 7.22
- (D) 3

Q57. Water flows through a pipe of area 0.02 m^2 at 2 m/s. What is the volume flow rate?

- (A) 2.02
- (B) 0.04
- (C) 0.01
- (D) 0.08

Q58. In a horizontal pipe, water speeds up from 1 m/s to 6 m/s. By how much does the pressure decrease? (Density of water = 1000 kg/m^3 .)

- (A) 5000
- (B) 17500
- (C) 2500
- (D) 8750

Q59. What is the absolute pressure at a depth of 15 m in water? (Atmospheric pressure = 101000 Pa , density of water = 1000 kg/m^3 , $g = 9.8 \text{ m/s}^2$.)

- (A) 147000
- (B) 116000
- (C) 247000
- (D) 248000

Q60. A alloy block has mass 40 kg and volume 0.1 m^3 . What is its density?

- (A) 400
- (B) 4
- (C) 0
- (D) 200

Answer Key

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

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