

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

**PHYSICAL SETTING
PHYSICS**

Tuesday, June 24, 2025 — 1:15 to 4:15 p.m., only

The possession or use of any communications device is strictly prohibited when taking this examination. If you have or use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

Answer all questions in all parts of this examination according to the directions provided in the examination booklet.

A separate answer sheet for Part A and Part B–1 has been provided to you. Follow the instructions from the proctor for completing the student information on your answer sheet. Record your answers to the Part A and Part B–1 multiple-choice questions on this separate answer sheet. Record your answers for the questions in Part B–2 and Part C in your separate answer booklet. Be sure to fill in the heading on the front of your answer booklet.

All answers in your answer booklet should be written in pen, except for graphs and drawings, which should be done in pencil. You may use scrap paper to work out the answers to the questions, but be sure to record all your answers on your separate answer sheet or in your answer booklet as directed.

When you have completed the examination, you must sign the statement printed on your separate answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet and answer booklet cannot be accepted if you fail to sign this declaration.

Notice . . .

A scientific or graphing calculator, a centimeter ruler, a protractor, and a copy of the *2006 Edition Reference Tables for Physical Setting/Physics*, which you may need to answer some questions in this examination, must be available for your use while taking this examination.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part A

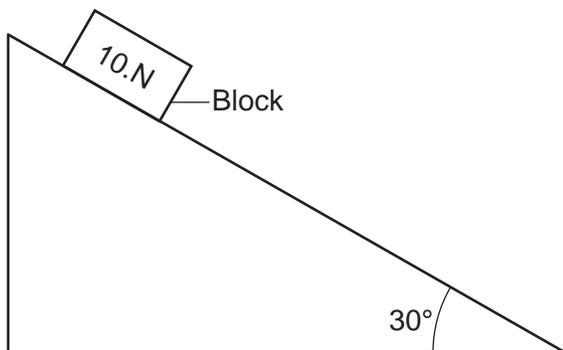
Answer all questions in this part.

Directions (1–35): For *each* statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the *2006 Edition Reference Tables for Physical Setting/Physics*. Record your answers on your separate answer sheet.

Base your answers to questions 1 and 2 on the information below and on your knowledge of physics.

A car, initially moving at 20.0 meters per second, travels 200. meters while accelerating uniformly to a speed of 30.0 meters per second.

- 1 The magnitude of the acceleration of the car is
(1) 0.0500 m/s² (3) 2.50 m/s²
(2) 1.25 m/s² (4) 3.13 m/s²
- 2 The time required for the car to travel the 200. meters is
(1) 6.67 s (3) 10.0 s
(2) 8.00 s (4) 20.0 s
-
- 3 A car traveling at 12 meters per second north accelerates in a straight line at 3.0 meters per second squared north for 4.0 seconds. How far north does the car travel during the 4.0 seconds it accelerates?
(1) 24 m (3) 54 m
(2) 48 m (4) 72 m
- 4 A block weighing 10. newtons rests on an inclined plane, as shown in the diagram below.



The magnitude of the component of the block's weight perpendicular to the plane is closest to

- (1) 5.0 N (3) 8.7 N
(2) 5.8 N (4) 10. N

- 5 A sailor is near the top of a sailboat mast. The sailboat is traveling at a constant velocity of 5.0 meters per second west. The sailor drops a screwdriver that falls freely for 1.0 second before hitting the deck of the sailboat. [Neglect friction.]

Where does the screwdriver land?

- (1) directly below the sailor
(2) 5.0 m behind the sailor
(3) 5.0 m in front of the sailor
(4) 49 m behind the sailor
- 6 A marble is projected horizontally from a fixed height above a level floor. If the marble is projected horizontally again from the same fixed height, but with twice the initial speed, its time of flight will be
(1) halved (3) unchanged
(2) doubled (4) quartered
- 7 Which animal has the greatest inertia?
(1) an 8.0-kg meerkat moving at 2 m/s
(2) a 350-kg zebra moving at 18 m/s
(3) a 190-kg lion moving at 0.5 m/s
(4) an 1800-kg hippopotamus at rest

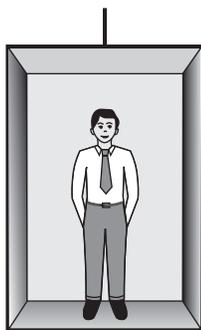
- 8 A cart is rolling along in a straight line on an inclined ramp. The cart is in equilibrium when it is rolling up or down the ramp with

- (1) decreasing speed
(2) increasing speed
(3) constant acceleration
(4) constant speed

- 9 A 3.5-kilogram bowling ball and a 7.0-kilogram bowling ball are in free fall near the surface of Earth. Compared to the magnitude of the acceleration of the 3.5-kilogram ball, the magnitude of the acceleration of the 7.0-kg ball is

- (1) half as great (3) the same
(2) twice as great (4) four times greater

- 10 The diagram below represents a 600-newton student standing in an elevator.



- The elevator floor exerts an upward force of 400 newtons on the student. The student has
- (1) a constant velocity directed downward
 - (2) a constant velocity directed upward
 - (3) an acceleration directed downward
 - (4) an acceleration directed upward

- 11 One end of a spring is held stationary and a 40.-newton force applied to the free end of the spring elongates the spring 0.20 meter from its unstretched length. What is the magnitude of the total force required to stretch the spring 0.80 meter from its unstretched length if the spring's elastic limit has *not* been exceeded?

- (1) 10. N
- (2) 20. N
- (3) 120 N
- (4) 160 N

- 12 The engine of a toy train is traveling at constant speed on a horizontal, circular track. If the speed of the engine is doubled, the magnitude of the centripetal acceleration of the engine is

- (1) halved
- (2) doubled
- (3) quartered
- (4) quadrupled

- 13 The strength of an electric field has a magnitude of 3.5×10^5 newtons per coulomb. What is the magnitude of the electrostatic force on a 5.3×10^{-6} -coulomb charge in this field?

- (1) 1.5×10^{-11} N
- (2) 1.9 N
- (3) 19 N
- (4) 6.6×10^{10} N

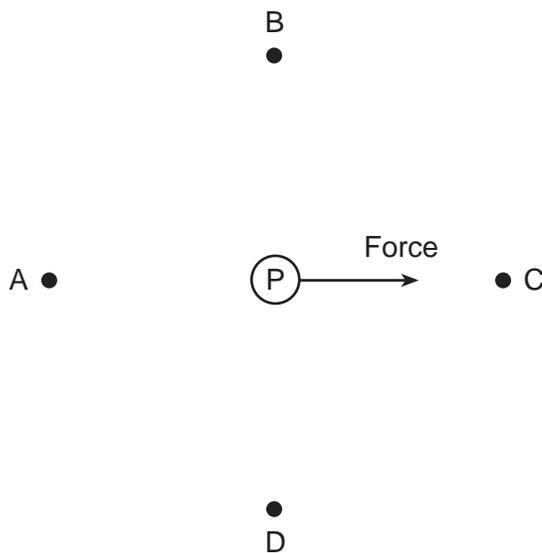
- 14 A car is traveling on a level highway at a speed of 15.0 meters per second. A braking force of magnitude 3.00×10^3 newtons brings the car to a stop in 10.0 seconds. The mass of the car is

- (1) 1.50×10^3 kg
- (2) 2.00×10^3 kg
- (3) 3.00×10^3 kg
- (4) 4.50×10^3 kg

- 15 A 5.00-kilogram cart traveling east at a speed of 15.0 meters per second collides with a 10.0 kilogram cart traveling west at a speed of 15.0 meters per second. The total momentum of the two-cart system after the collision is

- (1) 75.0 kg • m/s west
- (2) 75.0 kg • m/s east
- (3) 225 kg • m/s west
- (4) 225 kg • m/s east

- 16 In the diagram below, a force acts to the right on a proton, *P*, in an electric field.



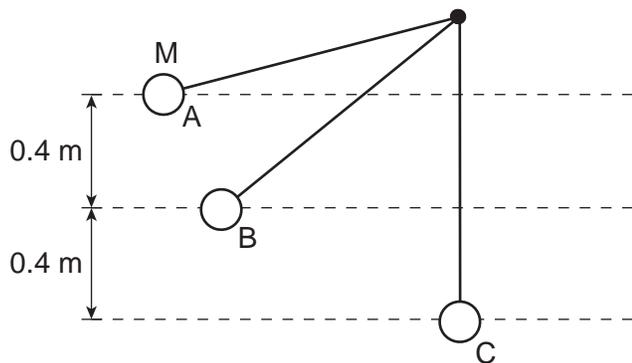
To produce this force, the direction of the electric field at the position of the proton is toward point

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

- 17 While investigating static electricity, a student notices a negatively charged plastic rod attracts a small piece of paper. The student correctly concludes the charge of the paper

- (1) must be negative
- (2) must be positive
- (3) could be negative or neutral
- (4) could be positive or neutral

- 21 As shown in the diagram of a pendulum below, mass M is released from rest at point A and allowed to swing through point B to point C . [Neglect friction.]



- Compared to the kinetic energy of mass M at point B , the kinetic energy of mass M at point C is
- (1) half as great (3) the same
 (2) twice as great (4) four times greater
- 22 A student, running at 6 meters per second, slides to rest on a horizontal floor. As the student slides, the internal energy of the student-floor system
- (1) decreases and the student's kinetic energy decreases
 (2) increases and the student's kinetic energy decreases
 (3) decreases and the student's kinetic energy remains the same
 (4) increases and the student's kinetic energy remains the same
- 23 Which object will most likely produce a magnetic field?
- (1) a stationary neutral object
 (2) a moving neutral object
 (3) a stationary charged object
 (4) a moving charged object
- 24 To *reduce* the electrical resistance of a copper wire, increase the wire's
- (1) length (3) diameter
 (2) temperature (4) resistivity

- 25 A potential difference of 12 volts is applied across a resistor for 60. seconds. A constant current of 0.10 ampere flows through the resistor during this time. What is the power of the resistor?
- (1) 1.2 W (3) 72 W
 (2) 12 W (4) 120 W

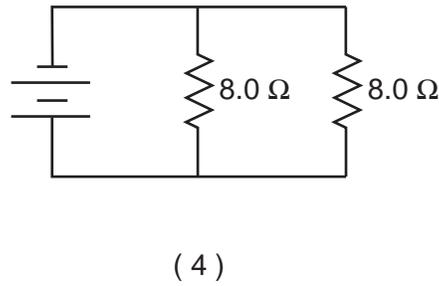
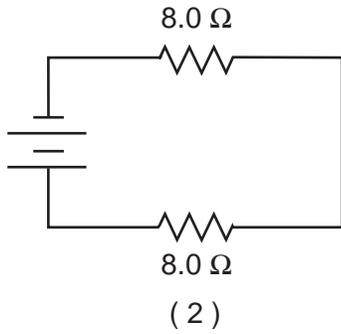
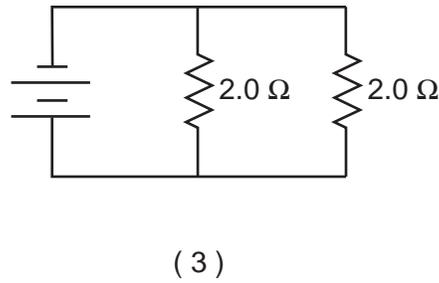
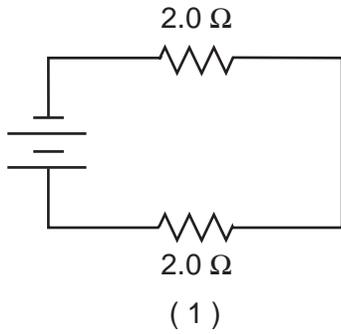
- 26 What type of waves are sound waves?
- (1) longitudinal waves
 (2) transverse waves
 (3) electromagnetic waves
 (4) ultraviolet waves

- 27 As waves travel through space, they transfer
- (1) mass, only
 (2) energy, only
 (3) both mass and energy
 (4) neither mass nor energy

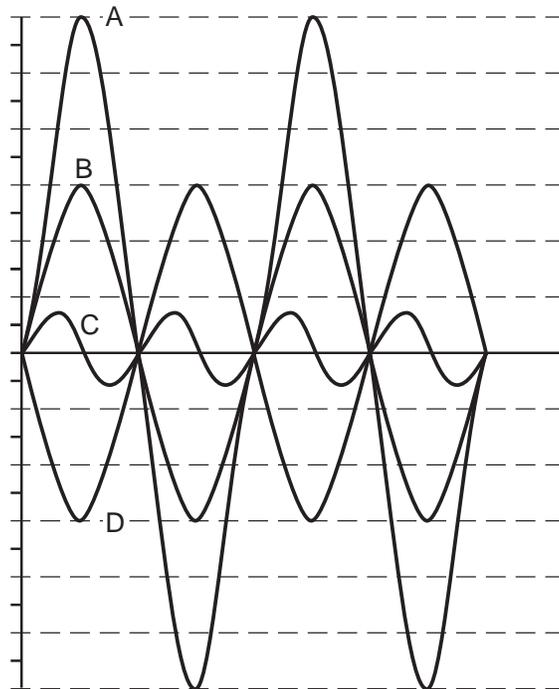
- 28 The frequency of an orange light wave is 4.85×10^{14} hertz. What is the wavelength of the wave in a vacuum?
- (1) 1.00×10^{-7} m (3) 5.96×10^{-7} m
 (2) 4.82×10^{-7} m (4) 6.19×10^{-7} m

- 29 Which statement describes mechanical and electromagnetic waves?
- (1) Mechanical waves all travel at the same speed in a vacuum, whereas the speeds of electromagnetic waves vary in a vacuum.
 (2) Mechanical waves all have the same frequency, whereas electromagnetic waves all have the same period.
 (3) Mechanical waves require a material medium through which to travel, whereas electromagnetic waves can travel through a vacuum.
 (4) Mechanical waves are transverse waves, whereas electromagnetic waves are longitudinal waves.

30 Which diagram represents a parallel circuit with an equivalent resistance of 4.0 ohms?



31 The diagram below shows four waves.



Which two waves, when superimposed, would produce complete destructive interference at every point along the waves?

- (1) A and C
- (2) A and D

- (3) B and C
- (4) B and D

32 A musician plays a flute by blowing across the opening in the mouth piece of the flute. This causes the air inside the flute to vibrate and produce sound waves. The phenomenon that causes the creation of these sound waves in a flute is

- (1) diffraction
- (2) refraction
- (3) resonance
- (4) the Doppler effect

33 Compared to FM radio waves, AM radio waves

- (1) travel faster in a vacuum
- (2) travel slower in a vacuum
- (3) have a higher frequency
- (4) have a longer wavelength

34 A star approaches Earth. Compared to the frequency and wavelength of the light emitted by the star, the light detected by an observer on Earth would have a

- (1) lower frequency and shorter wavelength
- (2) lower frequency and longer wavelength
- (3) higher frequency and shorter wavelength
- (4) higher frequency and longer wavelength

35 A beam of electrons directed at a polycrystalline nickel target scatters to form a diffraction pattern on a detecting screen. The diffraction of electrons is an example of the

- (1) particle nature of light
 - (2) Doppler effect
 - (3) action-reaction principle
 - (4) wave nature of matter
-

Part B-1

Answer all questions in this part.

Directions (36–50): For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the 2006 Edition Reference Tables for Physical Setting/Physics. Record your answers on your separate answer sheet.

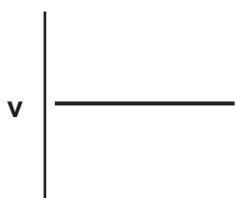
36 What is the approximate width of a typical five-passenger automobile?

- (1) 2×10^{-1} m (3) 2×10^1 m
 (2) 2×10^0 m (4) 2×10^2 m

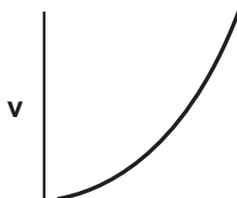
37 Two identical metal spheres with charges of +3.0 microcoulombs and -1.0 microcoulomb, respectively, are brought into contact and then separated. Which statement describes the electrostatic force between the spheres?

- (1) It is attractive before contact and repulsive after contact.
 (2) It is attractive both before contact and after contact.
 (3) It is repulsive before contact and attractive after contact.
 (4) It is repulsive both before contact and after contact.

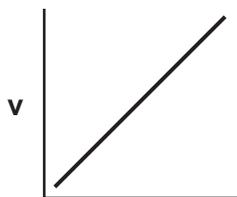
38 Which graph best represents the relationship between velocity, v , and time, t , for an object moving with constant positive acceleration?



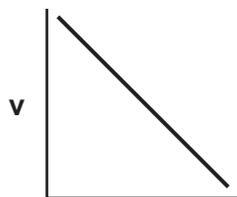
(1)



(3)

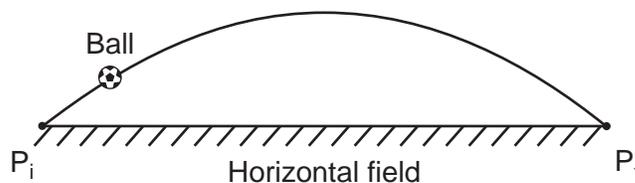


(2)



(4)

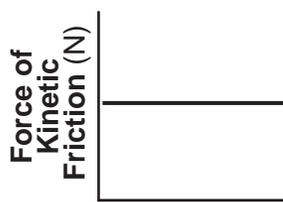
39 A soccer ball is kicked from point P_i at an angle above a horizontal field and lands on the field at point P_f . [Neglect friction.]



As the ball travels from P_i to P_f in air, the horizontal component of its velocity

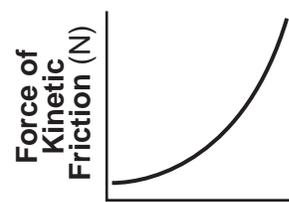
- (1) decreases, only
 (2) increases, only
 (3) decreases and then increases
 (4) remains the same

40 Which graph best represents the relationship between the forces of kinetic friction and the normal force exerted on wooden boxes of various weights as they are moved at constant velocity across a level, wooden floor?



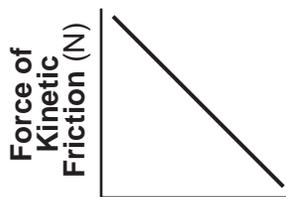
Normal Force (N)

(1)



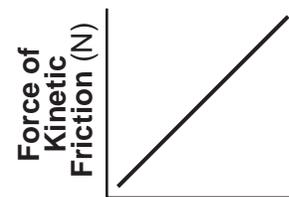
Normal Force (N)

(3)



Normal Force (N)

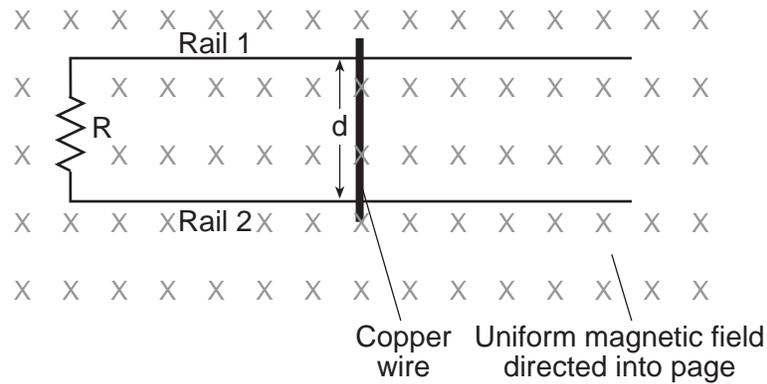
(2)



Normal Force (N)

(4)

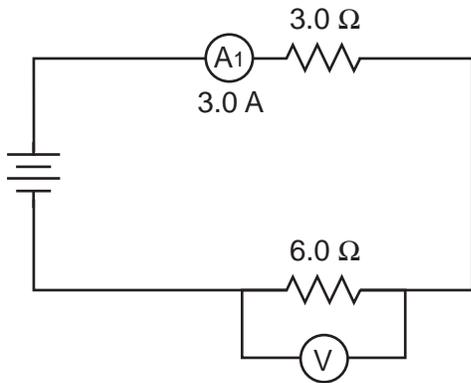
- 41 A 75-kilogram student runs up a set of stairs a vertical distance of 13 meters in 25 seconds. The average power developed by the student is
- (1) 3.0 W (3) 380 W
 (2) 39 W (4) 9600 W
- 42 The diagram below represents an apparatus consisting of two conducting rails connected to a resistor, R , and a copper wire of length d , connected to each rail in a uniform magnetic field directed into the page.



- Electrons will flow through resistor R if the copper wire is moving
- (1) to the right, only (3) either right or left
 (2) to the left, only (4) neither right nor left
- 43 The current through an incandescent lamp is 0.500 ampere. The number of elementary charges that pass through the lamp in 5.00 seconds is
- (1) 8.00×10^{-20} (3) 3.13×10^{18}
 (2) 4.00×10^{-19} (4) 1.56×10^{19}

Base your answers to questions 44 and 45 on the information and diagram below and on your knowledge of physics.

The diagram below represents an electrical circuit. The reading of A_1 is 3.0 amperes.



44 The equivalent resistance of the circuit is

- (1) 0.5Ω
- (2) 2.0Ω
- (3) 3.0Ω
- (4) 9.0Ω

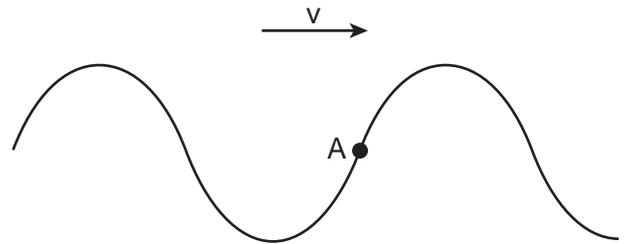
45 Compared to the potential difference across the 6-ohm resistor, the potential difference across the 3-ohm resistor is

- (1) the same
- (2) twice as much
- (3) one half as much
- (4) one quarter as much

46 Which expression is a unit of work?

- (1) $\frac{V^2 \cdot s}{\Omega}$
- (2) $\frac{V^2}{\Omega}$
- (3) $\frac{kg \cdot m}{s^2}$
- (4) $\frac{kg \cdot m^3}{s^3}$

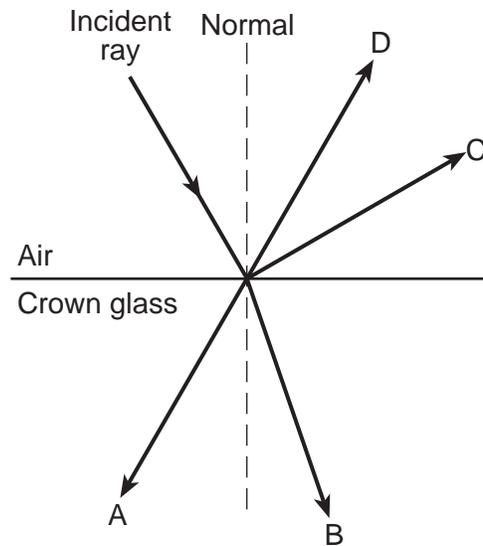
47 The diagram below represents a wave propagating to the right through a uniform medium. Point A represents a particle of the medium.



At the instant shown, the particle at point A is moving

- (1) right
- (2) left
- (3) up
- (4) down

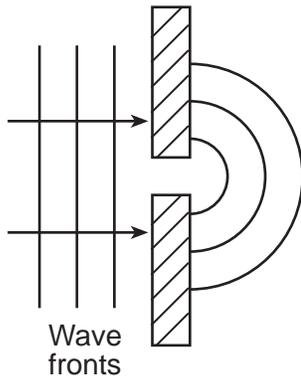
48 A ray traveling through air strikes a boundary with crown glass as shown.



Which path would the reflected ray take?

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

49 The diagram below shows wave fronts going through an opening and spreading into the area behind the barrier.



Which wave phenomenon is represented in the diagram?

- | | |
|--------------------|-----------------|
| (1) resonance | (3) diffraction |
| (2) Doppler effect | (4) reflection |

50 What occurs as an electron in a mercury atom moves from energy level b to energy level a ?

- (1) a photon is emitted with an energy of 4.64 J
- (2) a photon is absorbed with an energy of 4.64 J
- (3) a photon is emitted with an energy of 7.42×10^{-19} J
- (4) a photon is absorbed with an energy of 7.42×10^{-19} J

Part B–2

Answer all questions in this part.

Directions (51–65): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *2006 Edition Reference Tables for Physical Setting/Physics*.

Base your answers to questions 51 through 53 on the information below and on your knowledge of physics.

A 750-watt toaster is operating at 120 volts and is being used to heat a blueberry bagel for 2.5 minutes.

- 51 Determine the resistance of the toaster. [1]
- 52–53 Calculate the total amount of electrical energy consumed by the toaster during the heating of the bagel. [Show all work, including the equation and substitution with units.] [2]
-
- 54 In a linear accelerator, a proton is accelerated from rest through a potential difference of 4.40×10^6 volts. Determine the total kinetic energy, in joules, gained by this proton as it travels through this linear accelerator. [1]
- 55–56 Calculate the resistance of a 0.050-meter-long copper wire having a cross-sectional area of 5.73×10^{-10} meter squared at 20°C . [Show all work, including the equation and substitution with units.] [2]
- 57–58 During a football game, player A, a 70.0-kilogram football player, attempts to prevent player B, a 90.0-kilogram player, from scoring a touchdown. Player B is running toward player A at a constant speed of 6.50 meters per second. Calculate the speed of player A such that the magnitude of the momentum of player A is equal to the magnitude of the momentum of player B. [Show all work, including the equation and substitution with units.] [2]
- 59–60 A photon has a wavelength of 5.03×10^{-7} meter. Calculate the energy of this photon. [Show all work, including the equation and substitution with units.] [2]

Base your answers to questions 61 and 62 on the information below and on your knowledge of physics.

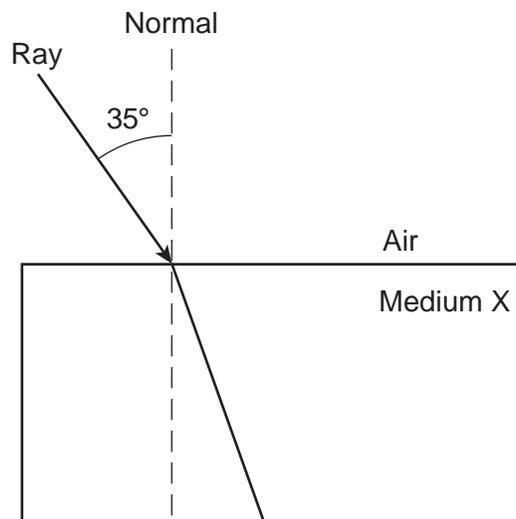
A 53-newton box on a horizontal surface is pulled toward the right by a horizontal force of 27 newtons. The force of friction exerted on the box by the surface has a magnitude of 16 newtons.

61 On the diagram *in your answer booklet*, use a scale of 1.0 cm = 10. N and start at point *P* to construct a vector representing the normal force exerted on the box by the floor. [1]

62 Determine the magnitude of the net force acting on the box. [1]

Base your answers to questions 63 through 65 on the information and diagram below and on your knowledge of physics.

A ray of monochromatic light ($f = 5.09 \times 10^{14}$ hertz) passes from air into a transparent medium, *X*, as shown in the diagram below.



63 Using a protractor, determine the angle of refraction in medium *X*, to the *nearest degree*. [1]

64–65 Calculate the absolute index of refraction of medium *X*. [Show all work, including the equation and substitution with units.] [2]

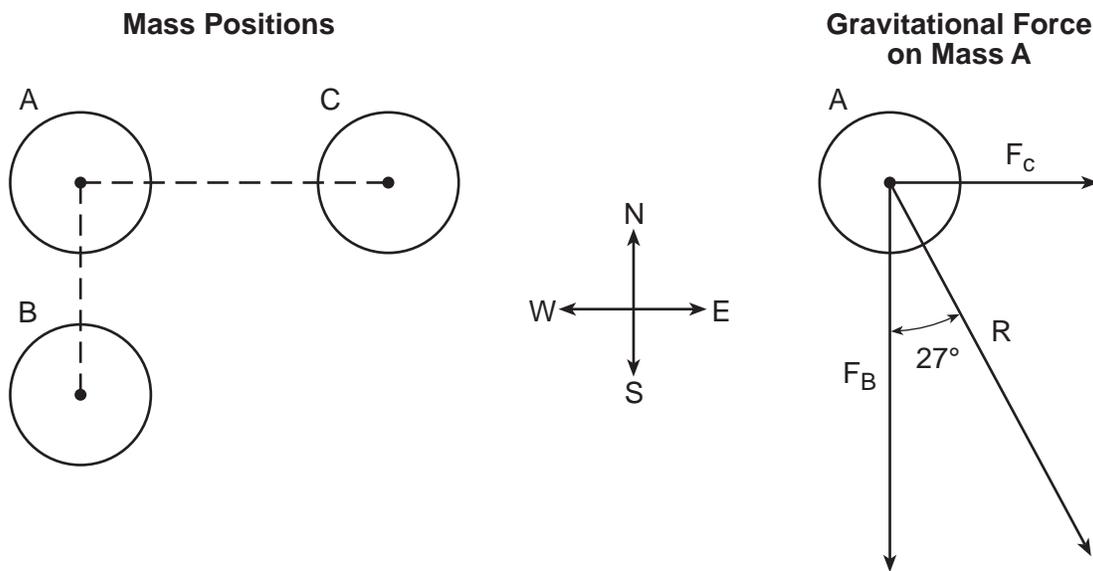
Part C

Answer all questions in this part.

Directions (66–85): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the 2006 Edition Reference Tables for Physical Setting/Physics.

Base your answers to questions 66 through 68 on the information and diagram below and on your knowledge of physics.

Three 4.0-kilogram spherical masses, A , B , and C , are positioned as shown below. Mass B and mass C exert gravitational forces on mass A . The gravitational force, F_B , exerted by mass B on mass A is 5.08×10^{-10} newton south. The resultant gravitational force, R , exerted on mass A is 5.74×10^{-10} newton at 27° east of south.



(Not drawn to scale)

66–67 Calculate the distance separating the centers of masses A and B . [Show all work, including the equation and substitution with units.] [2]

68 Mass A is removed and a 7.0-kilogram mass is placed at the same position. Compare the magnitude of the resultant gravitational force on the 7.0-kilogram mass with the magnitude of the original resultant gravitational force, R . [1]

Base your answers to questions 69 through 73 on the information and data table below and on your knowledge of physics.

An electric train with a mass of 2.8 kilograms moves from rest down a long, straight track. The table shows the train's momentum during the first 4.0 seconds of its trip.

Data Table

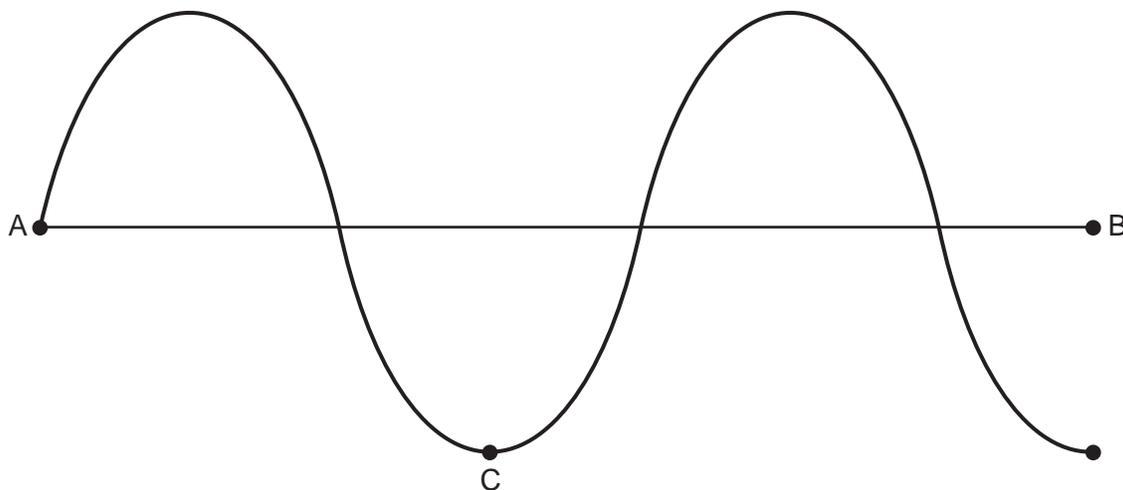
Time (s)	Momentum (kg • m/s)
0.0	0.0
0.5	2.1
1.0	4.2
1.5	6.3
2.0	8.4
2.5	11.0
3.0	13.0
3.5	15.0
4.0	18.0

Using information from the data table, construct a graph *in your answer booklet*, following the directions below.

- 69 Plot the momentum versus time for the first 4.0 seconds of the train's trip. [1]
- 70 Draw a best-fit line, using a straight edge, to represent the relationship between momentum and time. [1]
- 71 Using your best-fit line, determine the average force that acted upon the train. [1]
- 72–73 Calculate the magnitude of the average acceleration of the train. [Show all work, including the equation and substitution with units.] [2]
-

Base your answers to questions 74 through 77 on the information and diagram below and on your knowledge of physics.

The diagram below represents a medium as a periodic wave passes through it, traveling to the right. The wave requires 2.0 seconds to travel from point A to point B. The scale used in the diagram is 1.0 centimeter = 0.10 meter.



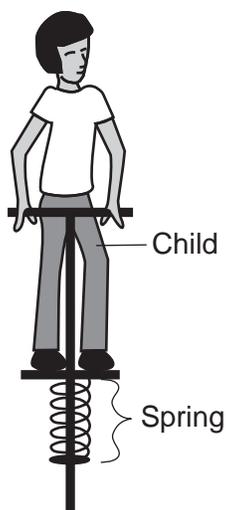
74 Determine the wavelength of the wave in meters. [1]

75–76 Calculate the speed of the wave in meters per second. [Show all work, including the equation and substitution with units.] [2]

77 On the diagram *in your answer booklet*, place an **X** on the wave at a position that is 180° out of phase with point C. [1]

Base your answers to questions 78 through 82 on the information and diagram below and on your knowledge of physics.

A pogo stick is a popular children's toy with a spring on the bottom. When a 51.0-kilogram child stands at rest on a pogo stick, the spring is compressed 0.15 meter.



78 Determine the magnitude of the weight of the child in newtons. [1]

79–80 Calculate the spring constant of the spring on the pogo stick. [Show all work, including the equation and substitution with units.] [2]

81–82 Calculate the total energy stored in the pogo stick's spring when the child's weight has compressed the spring 0.15 meter. [Show all work, including the equation and substitution with units.] [2]

Base your answers to questions 83 through 85 on the information below and on your knowledge of physics.

Scientists at the CERN Large Hadron Collider discovered a new subatomic particle. It is called the X_b particle and is composed of one down quark, one strange quark, and one bottom quark. The mass of the X_b particle is approximately 5950 MeV.

83 Determine both the sign and the magnitude of the charge of the X_b particle, in elementary charges. [1]

84 Identify the fundamental force that holds the quarks together in the X_b particle. [1]

85 Determine the mass of the X_b particle, in universal mass units. [1]

PHYSICAL SETTING PHYSICS

Tuesday, June 24, 2025 — 1:15 to 4:15 p.m., only

ANSWER BOOKLET

Student

Teacher

School Grade

Record your answers for Part B-2 and Part C in this booklet.

Part B-2

51 _____ Ω

52-53

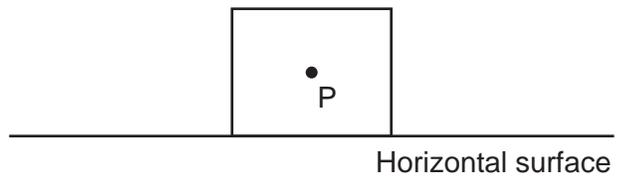
54 _____ J

55–56

57–58

59–60

61



62 _____ N

63 _____ °

64–65

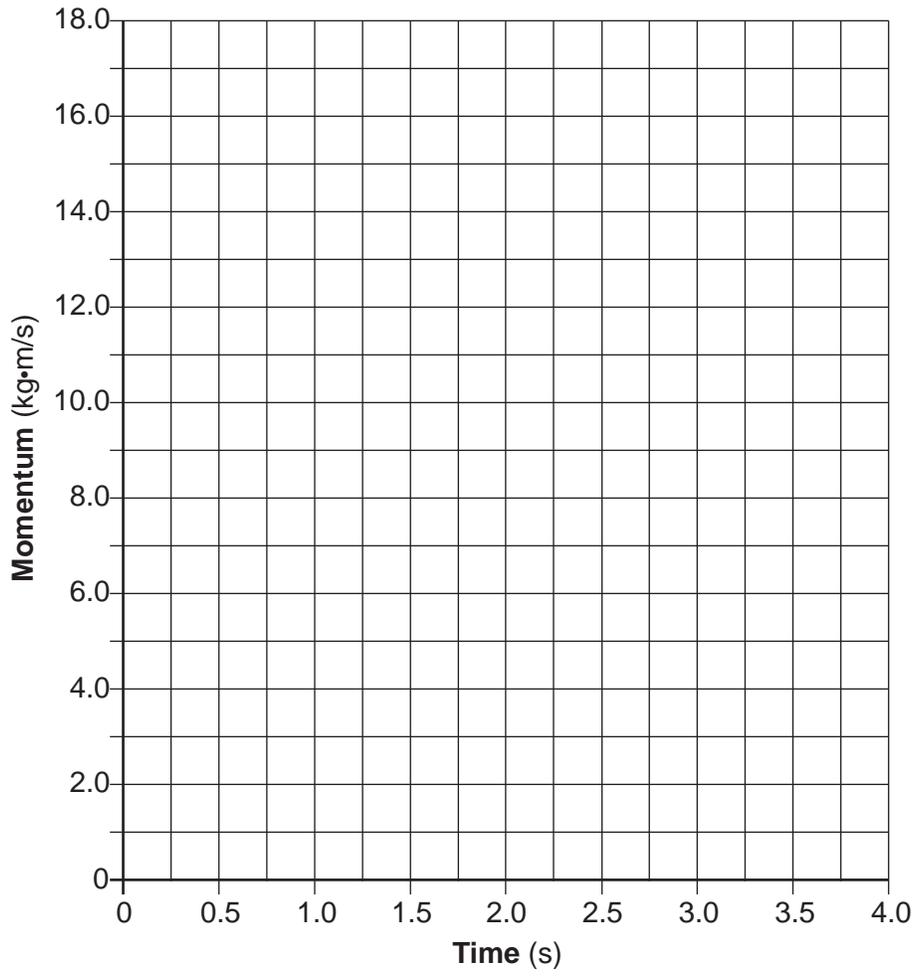
Part C

66–67

68

69–70

Momentum vs. Time



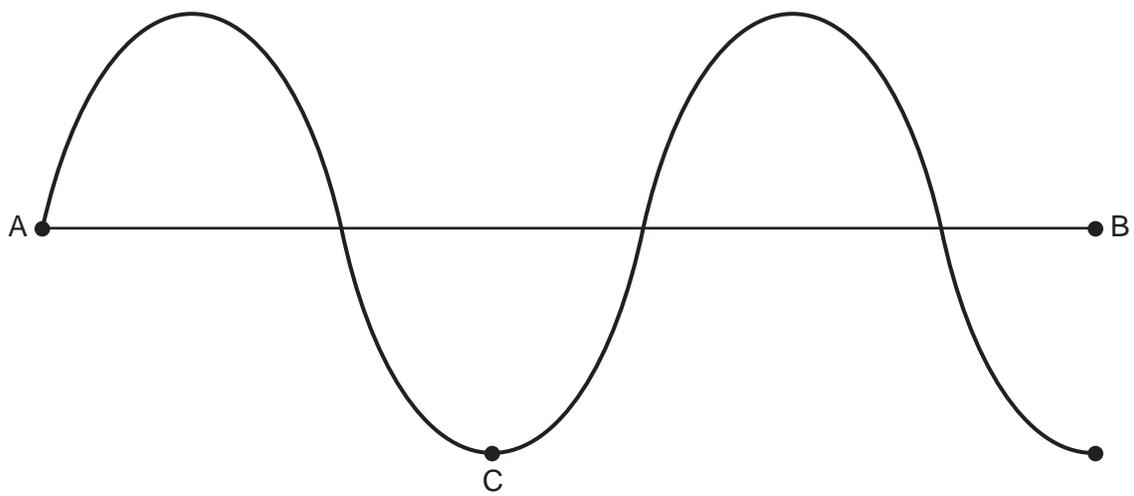
71 _____ N

72–73

74 _____ m

75-76

77



78 _____ N

79–80

81–82

83 _____ e

84 _____

85 _____ u

The State Education Department / The University of the State of New York
Regents Examination in Physical Setting/Physics – June 2025

Scoring Key: Parts A and B-1 (Multiple-Choice Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Physical Setting/Physics	June '25	1	2	MC	1	1
Physical Setting/Physics	June '25	2	2	MC	1	1
Physical Setting/Physics	June '25	3	4	MC	1	1
Physical Setting/Physics	June '25	4	3	MC	1	1
Physical Setting/Physics	June '25	5	1	MC	1	1
Physical Setting/Physics	June '25	6	3	MC	1	1
Physical Setting/Physics	June '25	7	4	MC	1	1
Physical Setting/Physics	June '25	8	4	MC	1	1
Physical Setting/Physics	June '25	9	3	MC	1	1
Physical Setting/Physics	June '25	10	3	MC	1	1
Physical Setting/Physics	June '25	11	4	MC	1	1
Physical Setting/Physics	June '25	12	4	MC	1	1
Physical Setting/Physics	June '25	13	2	MC	1	1
Physical Setting/Physics	June '25	14	2	MC	1	1
Physical Setting/Physics	June '25	15	1	MC	1	1
Physical Setting/Physics	June '25	16	3	MC	1	1
Physical Setting/Physics	June '25	17	4	MC	1	1
Physical Setting/Physics	June '25	18	3	MC	1	1
Physical Setting/Physics	June '25	19	1	MC	1	1
Physical Setting/Physics	June '25	20	1	MC	1	1
Physical Setting/Physics	June '25	21	2	MC	1	1
Physical Setting/Physics	June '25	22	2	MC	1	1
Physical Setting/Physics	June '25	23	4	MC	1	1
Physical Setting/Physics	June '25	24	3	MC	1	1
Physical Setting/Physics	June '25	25	1	MC	1	1
Physical Setting/Physics	June '25	26	1	MC	1	1
Physical Setting/Physics	June '25	27	2	MC	1	1
Physical Setting/Physics	June '25	28	4	MC	1	1
Physical Setting/Physics	June '25	29	3	MC	1	1
Physical Setting/Physics	June '25	30	4	MC	1	1
Physical Setting/Physics	June '25	31	4	MC	1	1
Physical Setting/Physics	June '25	32	3	MC	1	1
Physical Setting/Physics	June '25	33	4	MC	1	1
Physical Setting/Physics	June '25	34	3	MC	1	1
Physical Setting/Physics	June '25	35	4	MC	1	1
Physical Setting/Physics	June '25	36	2	MC	1	1
Physical Setting/Physics	June '25	37	1	MC	1	1
Physical Setting/Physics	June '25	38	2	MC	1	1
Physical Setting/Physics	June '25	39	4	MC	1	1
Physical Setting/Physics	June '25	40	4	MC	1	1
Physical Setting/Physics	June '25	41	3	MC	1	1
Physical Setting/Physics	June '25	42	3	MC	1	1
Physical Setting/Physics	June '25	43	4	MC	1	1
Physical Setting/Physics	June '25	44	4	MC	1	1
Physical Setting/Physics	June '25	45	3	MC	1	1
Physical Setting/Physics	June '25	46	1	MC	1	1
Physical Setting/Physics	June '25	47	4	MC	1	1
Physical Setting/Physics	June '25	48	4	MC	1	1
Physical Setting/Physics	June '25	49	3	MC	1	1
Physical Setting/Physics	June '25	50	3	MC	1	1

Regents Examination in Physical Setting/Physics – June 2025

Scoring Key: Parts B-2 and C (Constructed-Response Questions)

Examination	Date	Question Number	Scoring Key	Question Type	Credit	Weight
Physical Setting/Physics	June '25	51	-	CR	1	1
Physical Setting/Physics	June '25	52	-	CR	1	1
Physical Setting/Physics	June '25	53	-	CR	1	1
Physical Setting/Physics	June '25	54	-	CR	1	1
Physical Setting/Physics	June '25	55	-	CR	1	1
Physical Setting/Physics	June '25	56	-	CR	1	1
Physical Setting/Physics	June '25	57	-	CR	1	1
Physical Setting/Physics	June '25	58	-	CR	1	1
Physical Setting/Physics	June '25	59	-	CR	1	1
Physical Setting/Physics	June '25	60	-	CR	1	1
Physical Setting/Physics	June '25	61	-	CR	1	1
Physical Setting/Physics	June '25	62	-	CR	1	1
Physical Setting/Physics	June '25	63	-	CR	1	1
Physical Setting/Physics	June '25	64	-	CR	1	1
Physical Setting/Physics	June '25	65	-	CR	1	1
Physical Setting/Physics	June '25	66	-	CR	1	1
Physical Setting/Physics	June '25	67	-	CR	1	1
Physical Setting/Physics	June '25	68	-	CR	1	1
Physical Setting/Physics	June '25	69	-	CR	1	1
Physical Setting/Physics	June '25	70	-	CR	1	1
Physical Setting/Physics	June '25	71	-	CR	1	1
Physical Setting/Physics	June '25	72	-	CR	1	1
Physical Setting/Physics	June '25	73	-	CR	1	1
Physical Setting/Physics	June '25	74	-	CR	1	1
Physical Setting/Physics	June '25	75	-	CR	1	1
Physical Setting/Physics	June '25	76	-	CR	1	1
Physical Setting/Physics	June '25	77	-	CR	1	1
Physical Setting/Physics	June '25	78	-	CR	1	1
Physical Setting/Physics	June '25	79	-	CR	1	1
Physical Setting/Physics	June '25	80	-	CR	1	1
Physical Setting/Physics	June '25	81	-	CR	1	1
Physical Setting/Physics	June '25	82	-	CR	1	1
Physical Setting/Physics	June '25	83	-	CR	1	1
Physical Setting/Physics	June '25	84	-	CR	1	1
Physical Setting/Physics	June '25	85	-	CR	1	1

Key
MC = Multiple-choice question
CR = Constructed-response question

The chart for determining students' final examination scores for the **June 2025 Regents Examination in Physical Setting/Physics** will be posted on the Department's web site at <https://www.nysedregents.org/Physics/> on the day of the examination. Conversion charts provided for the previous administrations of the Physical Setting/Physics examination must NOT be used to determine students' final scores for this administration.

FOR TEACHERS ONLY

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING/PHYSICS

Tuesday, June 24, 2025 — 1:15 to 4:15 p.m., only

RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 2 before rating student papers.

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Regents Examination in Physical Setting/Physics. Additional information about scoring is provided in the publication *Information Booklet or Scoring Regents Examinations in the Sciences*.

Allow 1 credit for a correct response to each item.

At least two science teachers must participate in the scoring of each student's responses to the Part B–2 and Part C open-ended questions on a student's paper. Each of these teachers should be responsible for scoring a selected number of the open-ended questions on each answer paper. No one teacher is to score more than approximately one-half of the open-ended questions on a student's answer paper. Teachers may not score their own students' answer papers.

Students' responses must be scored strictly according to the Scoring Key and Rating Guide. For open-ended questions, credit may be allowed for responses other than those given in the rating guide if the response is a scientifically accurate answer to the question and demonstrates adequate knowledge, as indicated by the examples in the rating guide. Do not attempt to correct the student's work by making insertions or changes of any kind. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Fractional credit is *not* allowed. Only whole-number credit may be given for a response. If the student gives more than one answer to a question, only the first answer should be rated. Units need not to be given when the wording of the question allows such omissions.

For hand scoring, raters should enter the scores earned in the appropriate boxes printed on the separate answer sheet. Next, the rater should add these scores and enter the total in the box labeled "Total Raw Score." Then the student's raw score on the written test should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> on Tuesday, June 24, 2025. The student's scale score should be entered in the box labeled "Scale Score" on the student's answer sheet. The scale score is the student's final examination score.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that for each administration, the conversion chart provided for that administration be used to determine the student's final score.

Teachers should become familiar with the Department publication *Regents Examination in Physical Setting/Physics: Rating Guide for Parts B–2 and C*. This publication can be found on the New York State Education Department’s web site <https://www.nysed.gov/common/nysed/files/programs/state-assessment/physics-rating-guide.pdf>. This guide provides a set of directions, along with some examples, to assist teachers in rating parts B–2 and C of the Regents Examination in Physical Setting/Physics.

Scoring Criteria for Calculations

For each question requiring the student to *show all calculations, including the equation and substitution with units*, apply the following scoring criteria:

- Allow 1 credit for the equation and substitution of values with units. If the equation and/or substitution with units is not shown, do *not* allow this credit. Allow credit if the student has listed the values with units and written a correct equation.
 - Allow 1 credit for the correct answer (number and unit). If the number is given without the unit, allow credit if the credit for units was previously deducted for this calculation problem.
 - Penalize a student only once per calculation problem for incorrect or omitted units.
 - Allow credit if the answer is not expressed with the correct number of significant figures.
-

Part B–2

51 [1] Allow 1 credit for 19Ω .

52 [1] Allow 1 credit for the equation and substitution with units *or* for an answer, with units, that is consistent with the student's response to question 51. Refer to *Scoring Criteria for Calculations* in this rating guide.

Examples of 1-credit responses:

$$\begin{array}{l} W = Pt \\ W = (750 \text{ W})(150 \text{ s}) \end{array} \quad \text{or} \quad \begin{array}{l} W = \frac{V^2 t}{R} \\ W = \frac{(120 \text{ V})^2 (150 \text{ s})}{(19 \Omega)} \end{array}$$

53 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to questions 51 and/or 52.

Examples of 1-credit responses:

$$W = 110\,000 \text{ J} \quad \text{or} \quad W = 1.1 \times 10^5 \text{ J}$$

Note: Do *not* penalize the student more than 1 credit for errors in units in questions 52 and 53.

54 [1] Allow 1 credit for $7.04 \times 10^{-13} \text{ J}$

55 [1] Allow 1 credit for the equation and substitution with units. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 1-credit response:

$$\begin{array}{l} R = \frac{\rho L}{A} \\ R = \frac{(1.72 \times 10^{-8} \Omega \cdot \text{m})(0.050 \text{ m})}{5.73 \times 10^{-10} \text{ m}^2} \end{array}$$

56 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to question 55.

Example of a 1-credit response:

$$R = 1.5 \Omega$$

Note: Do *not* penalize the student more than 1 credit for errors in units in questions 55 and 56.

- 57 [1] Allow 1 credit for the equation and substitution with units. Refer to *Scoring Criteria for Calculations* in this rating guide.

Examples of 1-credit responses:

$$p = mv \qquad m_A v_A = m_B v_B$$

$$v = \frac{p}{m} \qquad \text{or} \qquad v_A = \frac{m_B v_B}{m_A}$$

$$v = \frac{585 \text{ kg} \cdot \text{m/s}}{70.0 \text{ kg}} \qquad v_A = \frac{(90.0 \text{ kg})(6.50 \text{ m/s})}{(70.0 \text{ kg})}$$

- 58 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to question 57.

Example of a 1-credit response:

$$v = 8.36 \text{ m/s}$$

Note: Do *not* penalize the student more than 1 credit for errors in units in questions 57 and 58.

- 59 [1] Allow 1 credit for the equation and substitution with units. Refer to *Scoring Criteria for Calculations* in this rating guide.

Examples of 1-credit responses:

$$E_{\text{photon}} = \frac{hc}{\lambda} \qquad E_{\text{photon}} = hf$$

$$E_{\text{photon}} = \frac{(6.63 \times 10^{-34} \text{ J} \cdot \text{s})(3.00 \times 10^8 \text{ m/s})}{(5.03 \times 10^{-7} \text{ m})} \qquad \text{or} \qquad E_{\text{photon}} = (6.63 \times 10^{-34} \text{ J} \cdot \text{s})(5.96 \times 10^{14} \text{ Hz})$$

- 60 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to question 59.

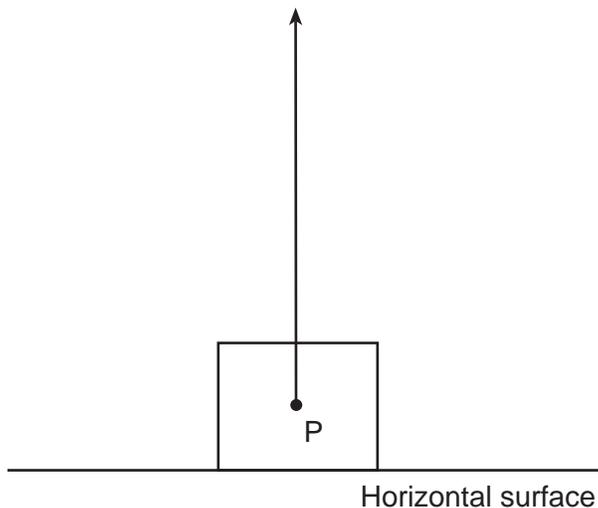
Example of a 1-credit response:

$$E_{\text{photon}} = 3.95 \times 10^{-19} \text{ J}$$

Note: Do *not* penalize the student more than 1 credit for errors in units in questions 59 and 60.

- 61 [1] Allow 1 credit for constructing a vector pointing toward the top of the page that is $5.3 \text{ cm} \pm 0.2 \text{ cm}$ in length.

Example of a 1-credit response:



Note: Do *not* penalize the student if the vector does not start at point *P*.

- 62 [1] Allow 1 credit for 11 N.
- 63 [1] Allow 1 credit for $20.^\circ \pm 2.^\circ$.
- 64 [1] Allow 1 credit for the equation and substitution with units *or* for an answer, with units, consistent with the student's response to question 63. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 1-credit response:

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

$$n_2 = \frac{n_1 \sin \theta_1}{\sin \theta_2}$$

$$n_2 = \frac{1.00 \sin 35^\circ}{\sin 20.^\circ}$$

- 65 [1] Allow 1 credit for the correct answer without units *or* for an answer, without units, that is consistent with the student's response to questions 63 and/or 64.

Examples of 1-credit responses:

$$n_2 = 1.7 \quad \text{or} \quad n_2 = 1.6$$

Note: Do *not* penalize the student more than 1 credit for errors in units in questions 64 and 65.

Part C

- 66 [1] Allow 1 credit for the equation and substitution with units. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 1-credit response:

$$F_g = \frac{Gm_1m_2}{r^2}$$

$$r = \sqrt{\frac{Gm_1m_2}{F_g}}$$

$$r = \sqrt{\frac{\left(6.67 \times 10^{-11} \frac{\text{N} \cdot \text{m}^2}{\text{kg}^2}\right) (4.0 \text{ kg})^2}{5.08 \times 10^{-10} \text{ N}}}$$

- 67 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to question 66.

Example of a 1-credit response:

$$r = 1.4 \text{ m}$$

Note: Do *not* penalize the student more than one credit for errors in units in questions 66 and 67.

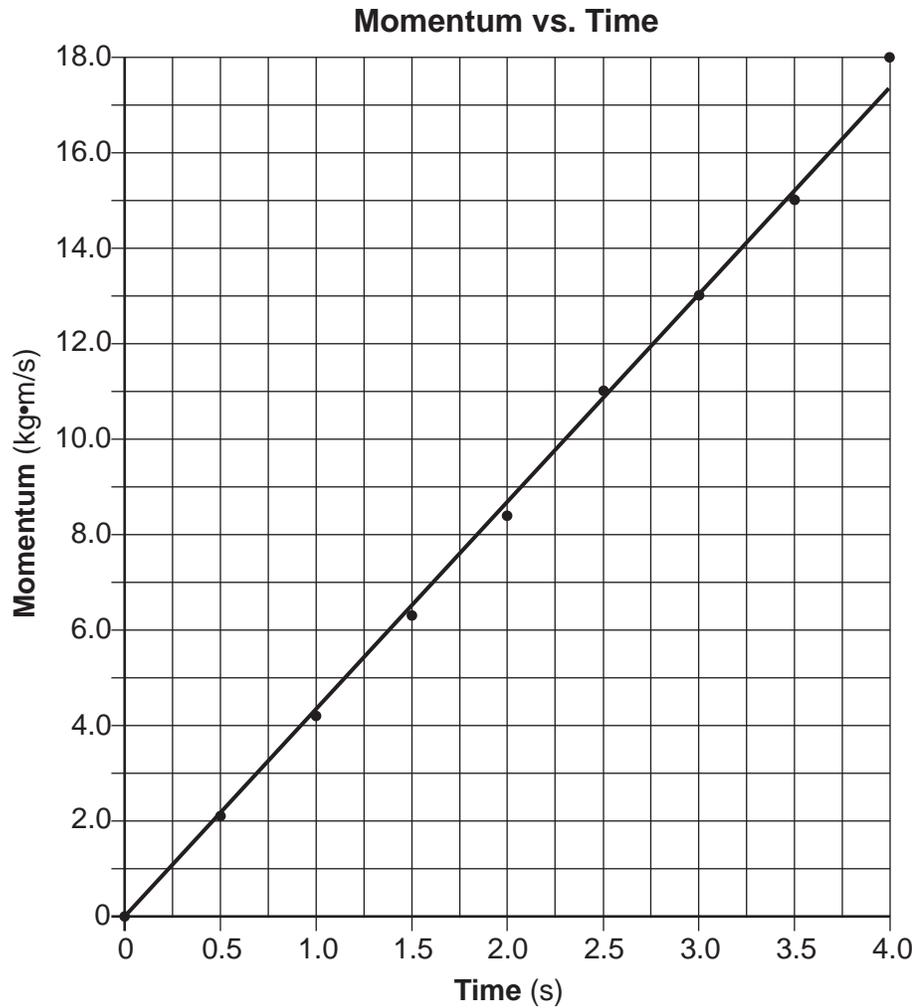
- 68 [1] Allow 1 credit indicating that the magnitude of the resultant force increases. Acceptable responses include, but are not limited to:

- It increases.
- gets larger
- The new resultant force has a greater magnitude.

69 [1] Allow 1 credit for plotting all points accurately ± 0.3 grid space.

70 [1] Allow 1 credit for drawing a best-fit line that is consistent with the student's response to question 69.

Example of a 2-credit response for questions 69 and 70:



71 [1] Allow 1 credit for $4.3 \text{ N} \pm 0.2 \text{ N}$ or for an answer that is consistent with the student's response to question 70.

- 72 [1] Allow 1 credit for the equation and substitution with units *or* for an answer, with units, consistent with the student's response to question 71. Refer to *Scoring Criteria for Calculations* in this rating guide.

Examples of 1-credit responses:

$$a = \frac{F_{net}}{m} \qquad \text{or} \qquad a = \frac{\Delta v}{t}$$
$$a = \frac{4.3 \text{ N}}{2.8 \text{ kg}} \qquad \qquad a = \frac{3.0 \text{ m/s}}{2.0 \text{ s}}$$

- 73 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to questions 71 and/or 72.

Example of a 1-credit response:

$$a = 1.5 \text{ m/s}^2$$

Note: Do *not* penalize the student more than one credit for errors in units in questions 72 and 73.

- 74 [1] Allow 1 credit for $0.80 \text{ m} \pm 0.02 \text{ m}$.

- 75 [1] Allow 1 credit for the equation and substitution with units *or* for an answer, with units, that is consistent with the student's response to question 74. Refer to *Scoring Criteria for Calculations* in this rating guide.

Examples of 1-credit responses:

$$\bar{v} = \frac{d}{t} \qquad \qquad v = f\lambda$$
$$\bar{v} = \frac{1.4 \text{ m}}{2.0 \text{ s}} \qquad \text{or} \qquad v = (0.88 \text{ Hz})(0.80 \text{ m})$$

- 76 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to questions 74 and/or 75.

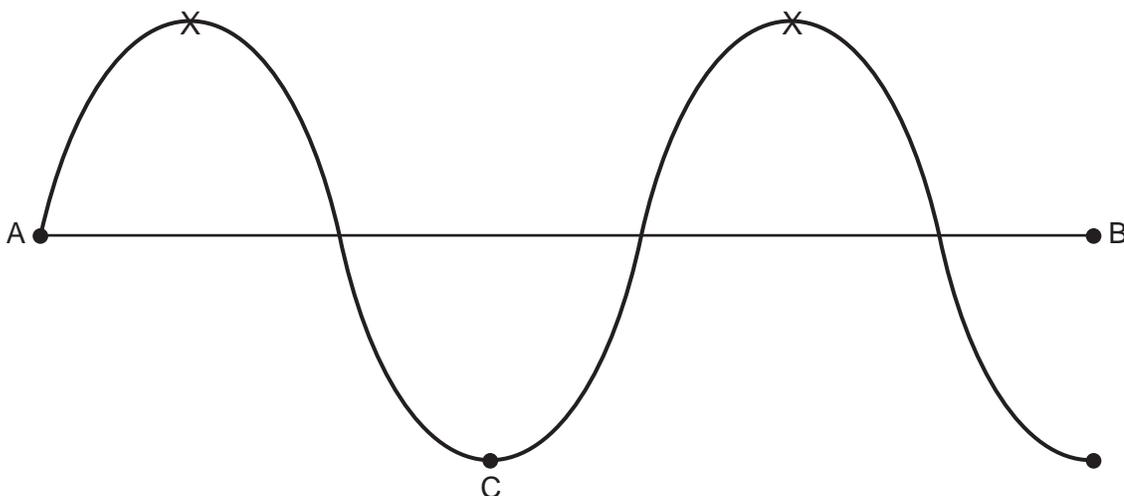
Example of a 1-credit response:

$$v = 0.70 \text{ m/s}$$

Note: Do *not* penalize the student more than one credit for errors in units in questions 75 and 76.

77 [1] Allow 1 credit for an **X** placed in either position as shown.

Examples of 1-credit responses:



78 [1] Allow 1 credit for 500. N.

79 [1] Allow 1 credit for the equation and substitution with units *or* for an answer, with units, that is consistent with the student's response to question 78. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 1-credit response:

$$F_s = kx$$

$$k = \frac{F_s}{x}$$

$$k = \frac{500. \text{ N}}{0.15 \text{ m}}$$

80 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to questions 78 and/or 79. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 1-credit response:

$$k = 3300 \text{ N/m}$$

Note: Do *not* penalize the student more than one credit for errors in units in questions 79 and 80.

- 81 [1] Allow 1 credit for the equation and substitution with units *or* for an answer, with units, that is consistent with the student's response to question 80. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 1-credit response:

$$PE_s = \frac{1}{2}kx^2$$

$$PE_s = \frac{1}{2}(3300 \text{ N/m})(0.15 \text{ m})^2$$

- 82 [1] Allow 1 credit for the correct answer with units *or* for an answer, with units, that is consistent with the student's response to questions 80 and/or 81. Refer to *Scoring Criteria for Calculations* in this rating guide.

Example of a 1-credit response:

$$PE_s = 37 \text{ J}$$

Note: Do *not* penalize the student more than one credit for errors in units in questions 81 and 82.

- 83 [1] Allow 1 credit for -1 e .

- 84 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

- strong nuclear force
- strong force
- strong

Note: Do *not* allow credit for nuclear force only.

- 85 [1] Allow 1 credit for 6.39 u.

Regents Examination in Physical Setting/Physics

June 2025

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the June 2025 Regents Examination in Physical Setting/Physics* will be posted on the Department's web site at: <https://www.nysed.gov/state-assessment/high-school-regents-examinations> on Tuesday, June 24, 2025. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Physics must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to <https://www.nysed.gov/state-assessment/teacher-feedback-state-assessments>.
2. Click [Regents Examinations](#).
3. Complete the required demographic fields.
4. Select the test title from the [Regents Examination](#) dropdown list.
5. Complete each evaluation question and provide comments in the space provided.
6. Click the SUBMIT button at the bottom of the page to submit the completed form.

Map to Core Curriculum

June 2025 Physical Setting/Physics			
Question Numbers			
Key Ideas	Part A	Part B1 + B2	Part C
Standard 1			
Math Key Idea 1	1, 2, 3, 4, 5, 11, 12, 13, 14, 15, 20, 21, 24, 25, 28, 30	39, 41, 43, 45, 46, 47, 48, 51, 52, 53, 54, 55, 56, 57, 58, 64, 65	66, 67, 71, 78, 79, 80, 84, 85
Math Key Idea 2		44	
Math Key Idea 3			83
Science Inquiry Key Idea 1			
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3	16, 17, 23, 33	37, 40, 42, 63	68
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Standard 6			
Key Idea 1	19, 22		
Key Idea 2	30	39	
Key Idea 3	13, 14, 28	36, 40	
Key Idea 4	8, 10		
Key Idea 5	5, 6, 9, 12, 21, 22, 24, 34		
Key Idea 6			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
4.1	19, 20, 21, 22	41, 44, 45, 51, 52, 53	81, 82
4.3	26, 31, 33	47, 48, 49	74, 75, 76, 77
5.1	4	38, 61, 62	69, 70, 72, 73
5.3		50, 59, 60	
Standard 4			
4.1	19, 20, 21, 22, 23, 24, 25, 30	41, 42, 44, 45, 46, 51, 52, 53, 54, 55, 56	81, 82
4.3	26, 27, 28, 29, 31, 32, 33, 34	47, 48, 49, 63, 64, 65	74, 75, 76, 77
5.1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18	37, 38, 39, 40, 57, 58, 61, 62	66, 67, 68, 69, 70, 71, 72, 73, 78, 79, 80
5.3	35	43, 50, 59, 60	83, 84, 85

Regents Examination in Physical Setting/Physics – June 2025

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

Raw Score Score	Scale Score						
85	100	63	79	41	56	19	29
84	99	62	78	40	55	18	28
83	98	61	77	39	54	17	27
82	97	60	76	38	53	16	25
81	97	59	75	37	51	15	24
80	96	58	74	36	50	14	23
79	95	57	73	35	49	13	21
78	94	56	72	34	48	12	20
77	93	55	71	33	47	11	19
76	92	54	70	32	46	10	17
75	91	53	69	31	44	9	16
74	90	52	68	30	43	8	14
73	89	51	67	29	42	7	13
72	88	50	66	28	41	6	11
71	87	49	65	27	40	5	9
70	86	48	64	26	38	4	8
69	85	47	63	25	37	3	6
68	84	46	62	24	36	2	4
67	83	45	61	23	35	1	2
66	82	44	59	22	33	0	0
65	81	43	58	21	32		
64	81	42	57	20	31		

To determine the student’s final examination score, find the student’s total test raw score in the column labeled “Raw Score” and then locate the scale score that corresponds to that raw score. The scale score is the student’s final examination score. Enter this score in the space labeled “Scale Score” on the student’s answer sheet.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Because scale scores corresponding to raw scores in the conversion chart change from one administration to another, it is crucial that for each administration the conversion chart provided for that administration be used to determine the student’s final score. The chart above is usable only for this administration of the Regents Examination in Physical Setting/Physics.