Name: Date: Period:

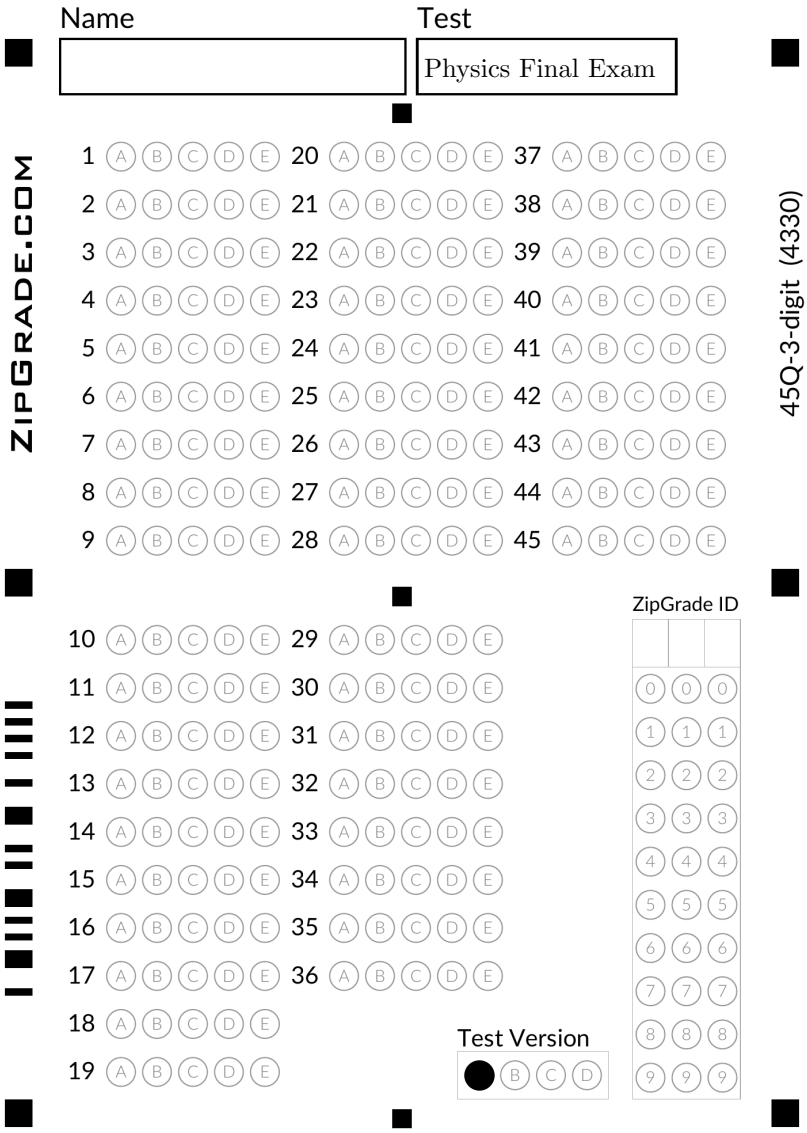
Physics I
Spring Final Exam

(Version A)

Please do not open this packet until instructed to do so!

Rules

1. **Phones, earbuds, headphones, and smartwatches must be put away in your backpacks during the entirety of the exam. If electronics are out for *any reason*, you will recieve a zero!**
2. Put your name three places: On your Scantron (back of this page), On your Equation Sheet (next page), and on the first page of the Exam Packet.
3. On your Scantron, bubble in your 3-digit ZipGrade ID from your notebook.
4. You may write on your equation sheet and on the exam. There is space provided to show your work, but only your scantron will be graded.
5. When you are finished, turn in your scantron, equation sheet, and exam packet up front.
6. Stay silent until all your classmates are finished. Electronics (especially phones, but also earbuds, headphones, laptops, smartwatches, etc.) need to be kept away until the instructor indicates that everyone is finished.


Name
Test
Physics Final Exam
ZIPGRADE.COM
45Q-3-digit (4330)
1 A B C D E 20 A B C D E 37 A B C D E
2 A B C D E 21 A B C D E 38 A B C D E
3 A B C D E 22 A B C D E 39 A B C D E
4 A B C D E 23 A B C D E 40 A B C D E
5 A B C D E 24 A B C D E 41 A B C D E
6 A B C D E 25 A B C D E 42 A B C D E
7 A B C D E 26 A B C D E 43 A B C D E
8 A B C D E 27 A B C D E 44 A B C D E
9 A B C D E 28 A B C D E 45 A B C D E
ZipGrade ID
10 A B C D E 29 A B C D E
11 A B C D E 30 A B C D E
12 A B C D E 31 A B C D E
13 A B C D E 32 A B C D E
14 A B C D E 33 A B C D E
15 A B C D E 34 A B C D E
16 A B C D E 35 A B C D E
17 A B C D E 36 A B C D E
18 A B C D E
19 A B C D E
Test Version
A B C D
0 0 0
1 1 1
2 2 2
3 3 3
4 4 4
5 5 5
6 6 6
7 7 7
8 8 8
9 9 9

Name: Date: Period:

Equation Sheet

Momentum

$$F \cdot t = \Delta p$$

$$\Delta p = p_f - p_i$$

$$\Sigma p_i = \Sigma p_f \qquad p = mv$$

Energy

$$W = Fd \qquad F_G = mg \qquad P = \frac{W}{t}$$

$$KE = \frac{1}{2}mv^2 \qquad PE = mgh \qquad KE_i + PE_i + W = KE_f + PE_f$$

Simple Harmonic Motion

$$T_P = 2\pi\sqrt{\frac{L}{g}} \qquad T_S = 2\pi\sqrt{\frac{m}{k}} \qquad F_S = -kd \qquad F_G = mg \qquad v = f\lambda$$

Light & Sound

$$v = f\lambda \qquad f = f_s\left(\frac{v \pm v_o}{v \mp v_s}\right) \qquad \frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f} \qquad M = \frac{h_i}{h_0} = \frac{-d_i}{d_o}$$

Speeds of Sound: air: 340 m/s water: 1530 m/s iron: 5100 m/s

Speed of Light: 3.0×10^8 m/s

Name: Date: Period:

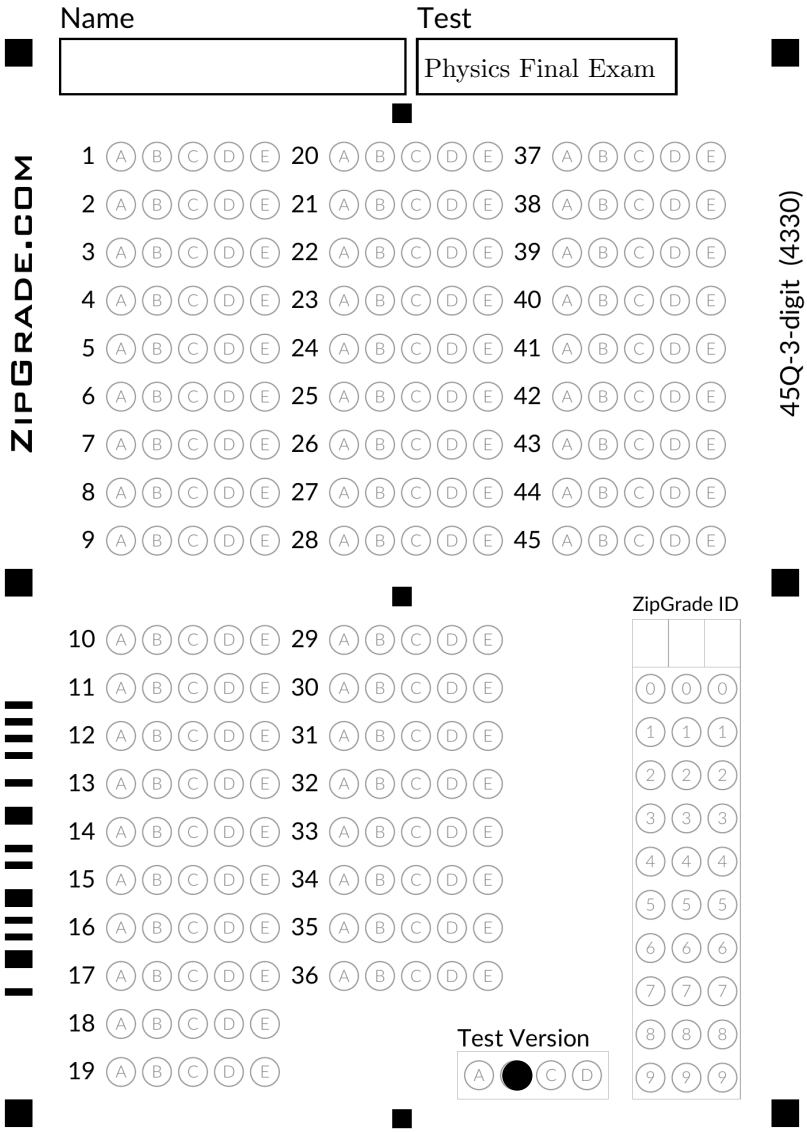
Physics I
Spring Final Exam

(Version B)

Please do not open this packet until instructed to do so!

Rules

1. **Phones, earbuds, headphones, and smartwatches must be put away in your backpacks during the entirety of the exam. If electronics are out for *any reason*, you will recieve a zero!**
2. Put your name three places: On your Scantron (back of this page), On your Equation Sheet (next page), and on the first page of the Exam Packet.
3. On your Scantron, bubble in your 3-digit ZipGrade ID from your notebook.
4. You may write on your equation sheet and on the exam. There is space provided to show your work, but only your scantron will be graded.
5. When you are finished, turn in your scantron, equation sheet, and exam packet up front.
6. Stay silent until all your classmates are finished. Electronics (especially phones, but also earbuds, headphones, laptops, smartwatches, etc.) need to be kept away until the instructor indicates that everyone is finished.


Name
Test
Physics Final Exam
ZIPGRADE.COM
45Q-3-digit (4330)
1 A B C D E 20 A B C D E 37 A B C D E
2 A B C D E 21 A B C D E 38 A B C D E
3 A B C D E 22 A B C D E 39 A B C D E
4 A B C D E 23 A B C D E 40 A B C D E
5 A B C D E 24 A B C D E 41 A B C D E
6 A B C D E 25 A B C D E 42 A B C D E
7 A B C D E 26 A B C D E 43 A B C D E
8 A B C D E 27 A B C D E 44 A B C D E
9 A B C D E 28 A B C D E 45 A B C D E
10 A B C D E 29 A B C D E
11 A B C D E 30 A B C D E
12 A B C D E 31 A B C D E
13 A B C D E 32 A B C D E
14 A B C D E 33 A B C D E
15 A B C D E 34 A B C D E
16 A B C D E 35 A B C D E
17 A B C D E 36 A B C D E
18 A B C D E
19 A B C D E
ZipGrade ID
0 0 0
1 1 1
2 2 2
3 3 3
4 4 4
5 5 5
6 6 6
7 7 7
8 8 8
9 9 9
Test Version
A B C D

Name: Date: Period:

Equation Sheet

Momentum

$$F \cdot t = \Delta p$$

$$\Delta p = p_f - p_i$$

$$\Sigma p_i = \Sigma p_f \qquad p = mv$$

Energy

$$W = Fd \qquad F_G = mg \qquad P = \frac{W}{t}$$

$$KE = \frac{1}{2}mv^2 \qquad PE = mgh \qquad KE_i + PE_i + W = KE_f + PE_f$$

Simple Harmonic Motion

$$T_P = 2\pi\sqrt{\frac{L}{g}} \qquad T_S = 2\pi\sqrt{\frac{m}{k}} \qquad F_S = -kd \qquad F_G = mg \qquad v = f\lambda$$

Light & Sound

$$v = f\lambda \qquad f = f_s\left(\frac{v \pm v_o}{v \mp v_s}\right) \qquad \frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f} \qquad M = \frac{h_i}{h_0} = \frac{-d_i}{d_o}$$

Speeds of Sound: air: 340 m/s water: 1530 m/s iron: 5100 m/s

Speed of Light: 3.0×10^8 m/s

Name: Date: Period:

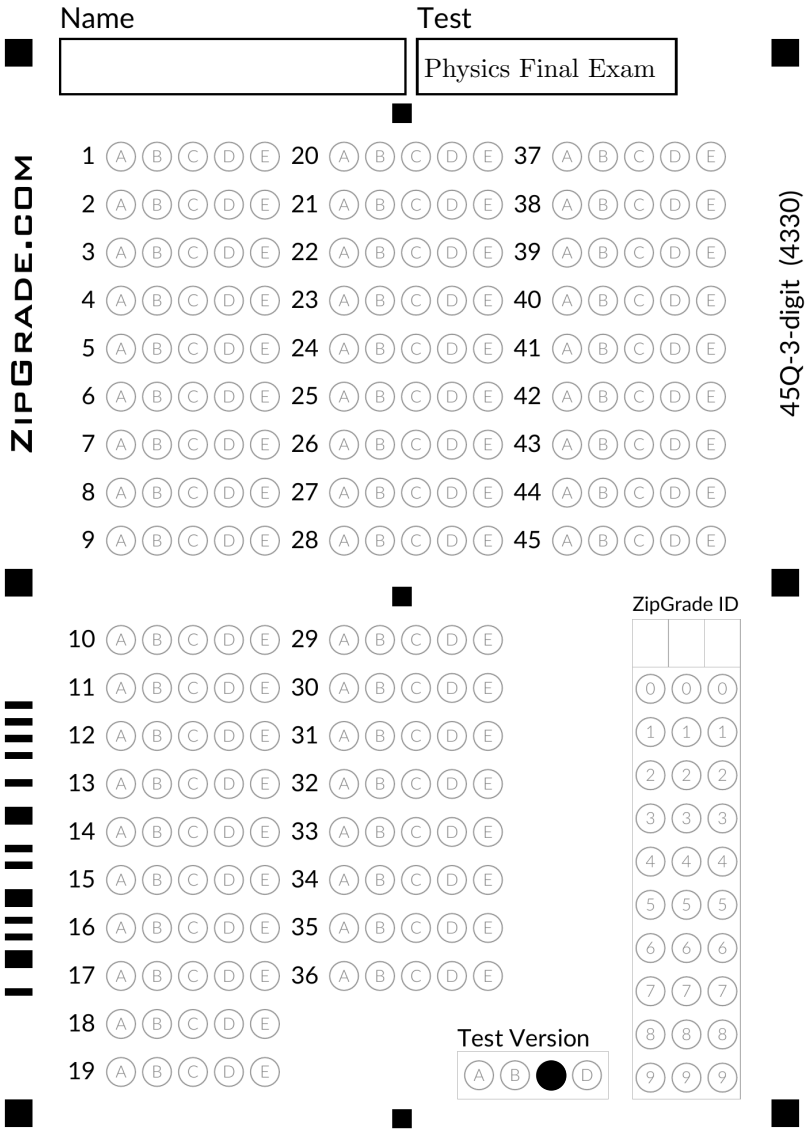
Physics I
Spring Final Exam

(Version C)

Please do not open this packet until instructed to do so!

Rules

1. **Phones, earbuds, headphones, and smartwatches must be put away in your backpacks during the entirety of the exam. If electronics are out for *any reason*, you will recieve a zero!**
2. Put your name three places: On your Scantron (back of this page), On your Equation Sheet (next page), and on the first page of the Exam Packet.
3. On your Scantron, bubble in your 3-digit ZipGrade ID from your notebook.
4. You may write on your equation sheet and on the exam. There is space provided to show your work, but only your scantron will be graded.
5. When you are finished, turn in your scantron, equation sheet, and exam packet up front.
6. Stay silent until all your classmates are finished. Electronics (especially phones, but also earbuds, headphones, laptops, smartwatches, etc.) need to be kept away until the instructor indicates that everyone is finished.


Name
Test
Physics Final Exam
ZIPGRADE.COM
45Q-3-digit (4330)
1 A B C D E 20 A B C D E 37 A B C D E
2 A B C D E 21 A B C D E 38 A B C D E
3 A B C D E 22 A B C D E 39 A B C D E
4 A B C D E 23 A B C D E 40 A B C D E
5 A B C D E 24 A B C D E 41 A B C D E
6 A B C D E 25 A B C D E 42 A B C D E
7 A B C D E 26 A B C D E 43 A B C D E
8 A B C D E 27 A B C D E 44 A B C D E
9 A B C D E 28 A B C D E 45 A B C D E
10 A B C D E 29 A B C D E
11 A B C D E 30 A B C D E
12 A B C D E 31 A B C D E
13 A B C D E 32 A B C D E
14 A B C D E 33 A B C D E
15 A B C D E 34 A B C D E
16 A B C D E 35 A B C D E
17 A B C D E 36 A B C D E
18 A B C D E
19 A B C D E
ZipGrade ID
0 0 0
1 1 1
2 2 2
3 3 3
4 4 4
5 5 5
6 6 6
7 7 7
8 8 8
9 9 9
Test Version
A B C D

Name: Date: Period:

Equation Sheet

Momentum

$$F \cdot t = \Delta p$$

$$\Delta p = p_f - p_i$$

$$\Sigma p_i = \Sigma p_f \qquad p = mv$$

Energy

$$W = Fd \qquad F_G = mg \qquad P = \frac{W}{t}$$

$$KE = \frac{1}{2}mv^2 \qquad PE = mgh \qquad KE_i + PE_i + W = KE_f + PE_f$$

Simple Harmonic Motion

$$T_P = 2\pi\sqrt{\frac{L}{g}} \qquad T_S = 2\pi\sqrt{\frac{m}{k}} \qquad F_S = -kd \qquad F_G = mg \qquad v = f\lambda$$

Light & Sound

$$v = f\lambda \qquad f = f_s\left(\frac{v \pm v_o}{v \mp v_s}\right) \qquad \frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f} \qquad M = \frac{h_i}{h_0} = \frac{-d_i}{d_o}$$

Speeds of Sound: air: 340 m/s water: 1530 m/s iron: 5100 m/s

Speed of Light: 3.0×10^8 m/s

Name: Date: Period:

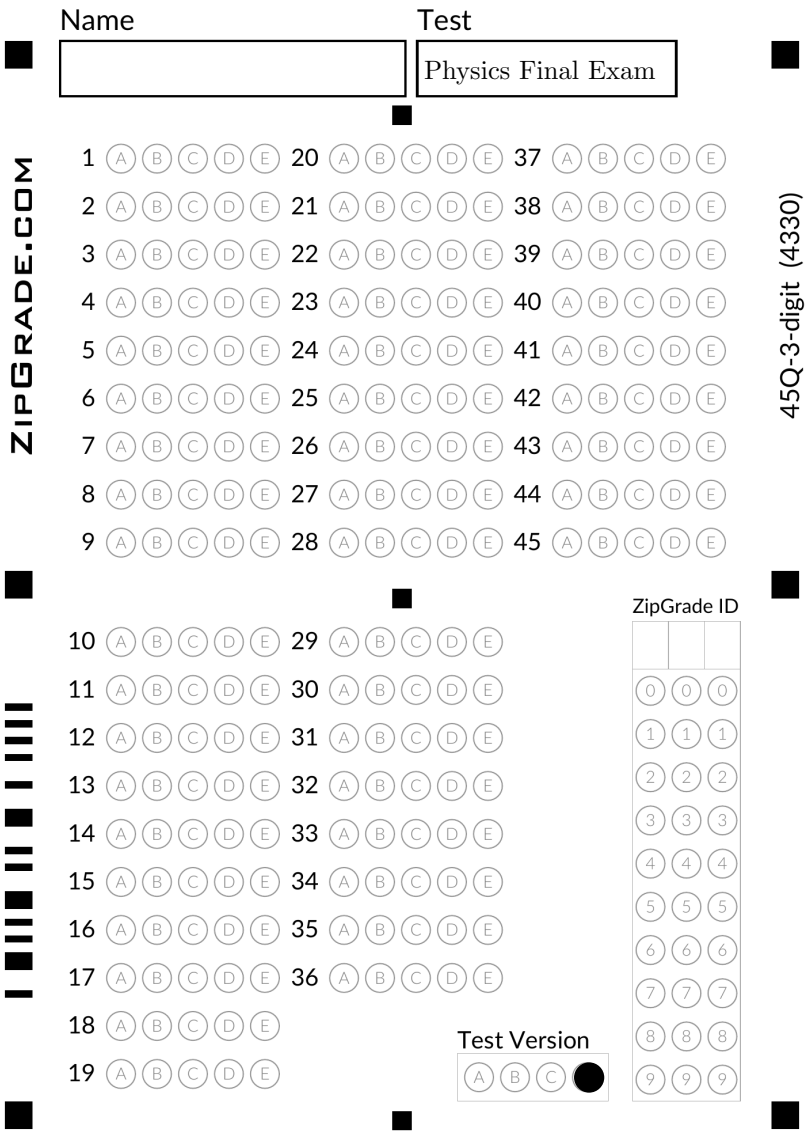
Physics I
Spring Final Exam

(Version D)

Please do not open this packet until instructed to do so!

Rules

1. **Phones, earbuds, headphones, and smartwatches must be put away in your backpacks during the entirety of the exam. If electronics are out for *any reason*, you will recieve a zero!**
2. Put your name three places: On your Scantron (back of this page), On your Equation Sheet (next page), and on the first page of the Exam Packet.
3. On your Scantron, bubble in your 3-digit ZipGrade ID from your notebook.
4. You may write on your equation sheet and on the exam. There is space provided to show your work, but only your scantron will be graded.
5. When you are finished, turn in your scantron, equation sheet, and exam packet up front.
6. Stay silent until all your classmates are finished. Electronics (especially phones, but also earbuds, headphones, laptops, smartwatches, etc.) need to be kept away until the instructor indicates that everyone is finished.


Name
Test
Physics Final Exam
ZIPGRADE.COM
45Q-3-digit (4330)
1 A B C D E 20 A B C D E 37 A B C D E
2 A B C D E 21 A B C D E 38 A B C D E
3 A B C D E 22 A B C D E 39 A B C D E
4 A B C D E 23 A B C D E 40 A B C D E
5 A B C D E 24 A B C D E 41 A B C D E
6 A B C D E 25 A B C D E 42 A B C D E
7 A B C D E 26 A B C D E 43 A B C D E
8 A B C D E 27 A B C D E 44 A B C D E
9 A B C D E 28 A B C D E 45 A B C D E
10 A B C D E 29 A B C D E
11 A B C D E 30 A B C D E
12 A B C D E 31 A B C D E
13 A B C D E 32 A B C D E
14 A B C D E 33 A B C D E
15 A B C D E 34 A B C D E
16 A B C D E 35 A B C D E
17 A B C D E 36 A B C D E
18 A B C D E
19 A B C D E
ZipGrade ID
0 0 0
1 1 1
2 2 2
3 3 3
4 4 4
5 5 5
6 6 6
7 7 7
8 8 8
9 9 9
Test Version
A B C

Name: Date: Period:

Equation Sheet

Momentum

$$F \cdot t = \Delta p$$

$$\Delta p = p_f - p_i$$

$$\Sigma p_i = \Sigma p_f \qquad p = mv$$

Energy

$$W = Fd \qquad F_G = mg \qquad P = \frac{W}{t}$$

$$KE = \frac{1}{2}mv^2 \qquad PE = mgh \qquad KE_i + PE_i + W = KE_f + PE_f$$

Simple Harmonic Motion

$$T_P = 2\pi\sqrt{\frac{L}{g}} \qquad T_S = 2\pi\sqrt{\frac{m}{k}} \qquad F_S = -kd \qquad F_G = mg \qquad v = f\lambda$$

Light & Sound

$$v = f\lambda \qquad f = f_s\left(\frac{v \pm v_o}{v \mp v_s}\right) \qquad \frac{1}{d_i} + \frac{1}{d_o} = \frac{1}{f} \qquad M = \frac{h_i}{h_0} = \frac{-d_i}{d_o}$$

Speeds of Sound: air: 340 m/s water: 1530 m/s iron: 5100 m/s

Speed of Light: 3.0×10^8 m/s