Answer Key					Pag	ge #
Kinematics Ranking Tasks			~			1
Ball Motion Diagrams—Velocity I	ADF	BE	C			2
Ball Motion Diagrams—Acceleration I Ball Motion Diagrams—Velocity II	ADF F	BE BE	C C	AD		3 4
Ball Motion Diagrams—Acceleration II	F	C	BE	AD		5
Objects in Different Situations—Accelerations	Ē	F	A	BC	D	6
Vertical Model Rockets—Maximum Height	BF	AEG	CDH			7
Vertical Arrows—Maximum Height	C	AF	BD	EG	Н	8
Position Time Graphs—Displacement	C	D	ABF	E		9
Cars—Change of Velocity Position Time Graphs—Average Speed	AE E	D F	BFG C	C D	H AB	10 11
Motion Diagrams—Displacement	DF	E	A	В	C	12
Motion Diagrams—Average Velocity	DF	E	A	В	C	13
People on Trains—Speed Relative to Ground	D	F	BE	AC	_	14
Force Ranking Tasks						15
Carts Moving along Horizontal Surface—String Tension	A	BE	C	DF		16
Carts Moving Along Horizontal Surface—Acceleration	DF	C	BE	A		17
Carts Moving along Horizontal Surface—Slowing Down	DF	C	BE	A		18
Two-Dimensional Forces on a Treasure Chest—Final Speed Two-Dimensional Forces on a Treasure Chest—Acceleration	AE AE	F F	BD BD	C C		19 20
Arrows—Acceleration	All san		БD	C		21
Rocks Thrown Upward—Net Force	CE	BH	DG	AF		22
Model Rockets Moving Upward—Net Force	AD	CFG	BH	E		23
Blocks Attached to Fixed Objects—Rope Tension	E	ACDFG	В	Н		24
Ball Motion Diagram—Net Force	ADF	BE	C			25
Force Acceleration Graphs—Mass	F	C	AD	В	E	26
Two Different Blocks and a Pulley—Tension	E F	C D	В	A		27
Ropes Pulling Boxes—Acceleration	A	BC	DEF			28
Ropes Pulling Boxes—Rope Tension Two Different Blocks and a Pulley—Net Force	D F	BE D	ACF E	ВС	A	29 30
Moving Car and Boat Trailer—Force Difference	All sam		ь	ьс	A	31
Accelerating Car and Boat Trailer—Force Difference	All sam					32
Car and Boat Trailer on an Incline—Force Difference	All sam					33
Forces on Objects on Smooth Surfaces—Velocity Change	В	A	CF	D	E	34
Forces on Objects on Smooth Surfaces—Speed Change	BE	AD	CF			35
Forces on Objects on Rough Surfaces—Velocity Change	В	A	CF	D	E	36
Forces on Objects on Rough Surfaces—Speed Change	All sam		D	CII		37
Person in an Elevator Moving Upward—Scale Weight Person in an Elevator Moving Downward—Scale Weight	AE AE	CDF CDF	B B	GH GH		38 39
Two Blocks at Rest—Force Difference	All sam		Ь	OH		40
Two Moving Blocks—Force Difference	All sam					41
Two Accelerating Blocks—Force Difference	All sam	e - 0				42
Horizontal Arrows at Different Distances—Force	All sam	e - 0				43
Horizontal Arrows at Different Times—Force		All same - 0				44
Horizontal Arrows at Different Distances and Times—Force	All sam	e - 0				45
Projectile and Other Two Dimensional Motion Ranking		DEE				46
Water Over a Waterfall—Time to Reach Ground Horizontal Arrows—Time to Hit Ground	ABC BC	DEF DGH	AEF			47 48
Rifle Shots—Time to Hit Ground	BC	DGH	AEF			49
Toy Trucks Rolling Off Tables—Time in Air	BC	DGH	AEF			50
Spheres Thrown Horizontally Off Cliffs—Time to Hit Ground	BC	DGH	AEF			51
Arrows—Maximum Heights	CF	BD	AEG	Η		52
Rock Throw—Maximum Heights	CDF	BG	AH	Е		53
Model Rockets Fired at an Angle—Horizontal Speed at Top	BEG	AFH	CD			54
Cannon Shots—Acceleration at the Top Carts on Incline—Height After Leaving Incline	All sam AD	e CE	Н	BFG		55 56
Projectile—Horizontal Distance	EF	CD	AB	DI O		57
Projectile—Time in Air	All sam		1110			58
Work-Energy Ranking Tasks						59
Boxcars and Ropes—Stopping Force in Same Distance	C F	D	E	В	A	60
Cars and Barriers—Stopping Force in Same Distance I	СН	E D	G B	F	A	61
Cars and Barriers—Stopping Distance with the Same Force	G H	C F	B D	Е	A	62
Cars—Work Done in Change of Velocity	E EF	AG PCD	CD	В	FH	63
Bouncing Cart—Change in Kinetic Energy Bouncing Cart—Work Done by the Barrier	EF EF	BCD BCD	A A			64 65
Bouncing Cart—Work Done on the Barrier	A	BCD	EF			66
Ranking Task Exercises in Physics 215				An	swer k	
Zuming Tunk Entriology in English				7 111	, , , O1 1	;

Malan and Winds	4 11					
Model Rockets—Kinetic Energy	All same		C	ъ	-	67
Sliding Masses on Incline—Kinetic Energy	F	AB	C	D	Е	68
Sliding Masses on Incline—Change in Potential Energy	F	AB	C	D	Е	69
Cars—Change in Kinetic Energy during a Change of Velocity	E ADF	AG BE	CD	В	FH	70 71
Ball Motion Diagram—Kinetic Energy	АDГ В		C	DE	Е	72
Equal Forces on Boxes—Work Done on Box	Б E	A DF	C C	DF	В	73
Equal Force on Boxes—Work Done on Hand	В	ADFG	E	A C	D	73 74
Velocity Time Graph—Work Done on Box Pendulums—Maximum Speed of the Bob	В	CD	E	AF		75
Force Pushing Box—Change in Kinetic Energy	AFH	CE	BDG	Air		76
Pushing Box—Change in Kinetic Energy Pushing Box with Friction—Change in Kinetic Energy	A C	B D	E F	GH		77
Impulse-Momentum Ranking Tasks	71 C	υυ	LI	GH		78
Carts and Springs—Spring Compression Time	CFG	В	DE	AH		79
Cars and Barriers — Stopping Time with the Same Force	GH	F	CD	BE	Α	80
Exploding Shells—Final Location of Center of Mass	ABC	DEF	CD			81
Bouncing Cart—Change in Momentum I	BG	A	EF	CDH		82
Bouncing Cart—Change in Momentum II	All same			0211		83
Bouncing Cart—Change in Momentum III	AC	DE	BF			84
Force Pushing Box—Change in Momentum	AFH	CE	BDG			85
Force Pushing Box—Final Momentum	F A	C	Е	D	В	86
Cars—Impulse During a Change of Velocity	ΑE	D	BFG	C	Н	87
Cars—Change in Momentum during a Change of Velocity	AE	D	BFG	C	Н	88
Rotation Ranking Tasks						89
Four L's Rotating About an Axis (side view)—Moment of Inertia	C	ABD				90
Five T's Rotating About an Axis (top view)—Moment of Inertia	В	A	DE	C		91
Four T's Rotating About an Axis (side view)—Moment of Inertia	C	D	AB			92
Five T's Rotating About an Axis (top view)—Net Gravitational Torque	В	A	DE	C		93
Five T's Rotating About an Axis (top view)—Angular Acceleration	A	DE	В	C		94
Blocks on Rotating Turntables—Horizontal Force	F	AB	D	E	C	95
Hanging Weights and Fixed Disks—Torque	F B	A	D	E	C	96
Horizontal Uniform Rods—Angular Acceleration	C E	A	В	F	D	97
Horizontal Uniform Rods—Change in Angular Momentum	В	E	AF	C	D	98
Rotating Systems of Point Masses—Difficult to Rotate	D A	E	В	C	F	99
Rotating Systems of Point Masses—Center of Mass	D	A	CE	В	F	100
Statics—Difficult to Hold I	F	AC	EG	D	В	101
Statics—Difficult to Hold I I	DE	CF	AB	G		102
Properties of Matter Ranking Tasks						103
Springs and Masses—Period of Oscillating Mass	H D	EF	C	В	AG	104
Blocks Suspended in Liquids—Buoyant Force	AB	C	DF	Ε		105
Blocks Suspended in Liquids—Volume of Liquid Displaced	All	same				106
Blocks Suspended in Liquids—Mass of Liquid Displaced	AB	C DF	E			107
Blocks Suspended in Liquids at Different Depths—Buoyant Force		BDE	ACF			108
Floating Blocks with Different Loads—Buoyant Force	DG	F AB				109
Blocks Suspended in Water—String Tension	C BF	A	D E			110
Blocks Suspended in Liquids—Buoyant Force II	B EF	CD				111
Blocks Floating in Liquids—Buoyant Force	E G	CF	DH	AB		112
Blocks at the Bottom of Liquids—Buoyant Force	B FG	CE	AH		D	113
Cylinders of Water—Pressure on the Plug I	H CF	AG				114
Cylinders of Liquids—Pressure on the Plug II	C	E	F	AB	D	115
Heat and Thermodynamics Ranking Tasks	C					116
Copper and Water in Styrofoam Cups Maximum Temperature						117
Copper and Water in Styrofoam Cups—Maximum Temperature	C	B F	E A	D		
Various Thermodynamic Processes—Work Done by Gas	C IB	B F L	ľΤ		IV	118
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure	C IB A C	B F L EF	IT D B	A		118 119
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I	C IB A C B	B F L EF C	IT D B A	A D	Е	118 119 120
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II	C IB A C B C D	B F L EF C B E	IT B A AF	A D H	E G	118 119 120 121
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy	C IB A C B C D CH	B F L EF C B E DG	IT D B A AF A	A D H EF	E G B	118 119 120 121 122
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature	C IB A C B C D CH B	B F L EF C B E DG D	TT D B A AF A AF A	A D H EF CEGH	E G B F	118 119 120 121 122 123
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature	C IB A C B C D CH B B DG	B F L EF C B E DG D A	IT D B A AF A AF A CEF	A D H EF CEGH C	E G B	118 119 120 121 122 123 124
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure	C IB A C B C D CH B B DG G DF	B F L EF C B E DG D A AB6	TT D B A AF A A C EF CH	A D H EF CEGH C	E G B F H	118 119 120 121 122 123 124 125
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy	C IB A C B C D CH B B DG	B F L EF C B E DG D A	IT D B A AF A AF A CEF	A D H EF CEGH C	E G B F	118 119 120 121 122 123 124 125 126
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy Wave Ranking Tasks	C IB A C B C D CH B B DG G DF CH	B F L EF C B E DG D A ABG	IT D B A AF A A EF CCH A	A D H EF CEGH C	E G B F H	118 119 120 121 122 123 124 125 126 127
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy Wave Ranking Tasks Wave Forms with Same Frequency—Wave Speed	C IB A C B C D CH B B DG G DF CH CD	B F L EF C B E DG D A ABC	TT D B A AF A A C EF CH	A D H EF CEGH C	E G B F H	118 119 120 121 122 123 124 125 126 127
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy Wave Ranking Tasks Wave Forms with Same Frequency—Wave Speed Wave Pulses—Leading Edge Time to Travel	C IB A C B C D CH B B DG G DF CH CD All same	B F L EF C B E DG D A ABC	IT D B A AF A A A C EF CH A BF	A D H EF CEGH C E EF	E G B F H	118 119 120 121 122 123 124 125 126 127 128 129
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy Wave Ranking Tasks Wave Forms with Same Frequency—Wave Speed Wave Pulses—Leading Edge Time to Travel Standing Waves—Frequency	C IB A C B C D CH B B DG G DF CH CD All same B	B F L EF C B E DG D A ABC DG AE	IT D B A AF A A A C EF CH A BF	A D H EF CEGH C E EF	E G B F H B	118 119 120 121 122 123 124 125 126 127 128 129 130
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy Wave Ranking Tasks Wave Forms with Same Frequency—Wave Speed Wave Pulses—Leading Edge Time to Travel Standing Waves—Frequency Standing Waves — Wavelength	C IB A C B C D CH B B DG G DF CH CD All same B FG	B F L EF C B E DG D A ABC DG AE AE C	IT D B A AF A A C EF CH A BF	A D H EF CEGH C E EF C AE	E G B F H B	118 119 120 121 122 123 124 125 126 127 128 129 130 131
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy Wave Ranking Tasks Wave Forms with Same Frequency—Wave Speed Wave Pulses—Leading Edge Time to Travel Standing Waves—Frequency Standing Waves — Wavelength Standing Waves Systems — Wave Speed	C IB A C B C D CH B B DG G DF CH CD All same B FG B	B F L EF C B E DG D A ABC DG AE AE C F	IT D B A AF A A A C EF CH A BF	A D H EF CEGH C E EF	E G B F H B	118 119 120 121 122 123 124 125 126 127 128 129 130 131
Various Thermodynamic Processes—Work Done by Gas Gas Cylinders—Pressure Pressure vs. Volume Graph—Temperature at Different Points I Pressure vs. Volume Graph—Temperature at Different Points II Pressure, Temperature, and Molecules—Internal Energy Pressure, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Temperature Internal Energy, Volume, and Molecules—Pressure Temperature, Pressure, and Molecules—Internal Energy Wave Ranking Tasks Wave Forms with Same Frequency—Wave Speed Wave Pulses—Leading Edge Time to Travel Standing Waves—Frequency Standing Waves — Wavelength	C IB A C B C D CH B B DG G DF CH CD All same B FG	B F L EF C B E DG D A ABC DG AE AE C F	IT D B A AF A A C EF CH A BF	A D H EF CEGH C E E A C A A C	E G B F H B	118 119 120 121 122 123 124 125 126 127 128 129 130 131 132

Pairs of Transverse Waves—Superposition	AC	В	DF	E		134
Wave Forms with Same Wavelength—Wave Energy	C	AB	EF	D		135
Electrostatics Ranking Tasks						136
Two Electric Charges—Electric Force	C	DE	BG	AF		137
Three Linear Electric Charges — Electric Force	D C	A	F	E	В	138
Two Nonlinear Electric Charges — Electric Force	AEFG	BC	DH			139
Charged Conducting Spheres—Electric Field at the Center	All zero					140
Charged Conducting Spheres—Electric Potential at the Center	E	AFH	B D	C	G	141
Charged Conducting Spheres—Electric Field at Various points	F	C	ABDE			142
Charged Conducting Spheres—Electric Potential at Various Points	DE	F	AB	C		143
Charges Outside a Conducting Sphere—Force on Enclosed Charge	All zero	•		•		144
Point Charges Outside Conducting Spheres—Electric Field Within	All zero					145
Induced Charges—Positive and Negative	B E	D	FG	CA		146
Induced Charges—Near a Charged Rod	BE E	CD	AF	CA		147
	CD	AB	EF			148
Pairs of Charges—Attractive and Repulsive Force				F	С	149
Suspended Charges—Angle Lightness Floring Field Floring Farms on Charge at Boot I	A 11	_	BD	Г	C	
Uniform Electric Field—Electric Force on Charge at Rest I	All same					150
Uniform Electric Field—Electric Force on Charge at Rest II	All same					151
Uniform Electric Field/Potential Lines—Electric Force on Charge at Rest III		All same)			152
Uniform Electric Field—Electric Force on Various Charges at Rest	DE -	ABCF				153
Two Electric Charges—Electric Field Along Line	В	AF	CE	DG		154
Electron Within a Charged Capacitor—Force on the Electron	BF	ADE	C			155
Transfer of Charge in Conductors—Left Conductor	A EH		В	FG	D	156
Transfer of Charge in Conductors—Right Conductor	A EH	C I	В	FG	D	157
Non-Uniform Electric Field—Electric Potential	AB	C	D	E	F	158
Non-Uniform Electric Field—Electric Field Strength	AB	C	D	E	F	159
Uniform Electric Field—Potential Difference	G	DH	ACE	BF		160
Uniform Electric Field—Strength of the Electric Field I	All same					161
Uniform Electric Field—Strength of the Electric Field II	All same					162
Uniform Electric Field/Potential Lines—Strength of the Electric Field	All same					163
Uniform Electric Field—Electric Potential at Different Points II	C	AB	DE	F		164
Uniform Electric Field—Potential Energy of a Positive Charge	C	AB	DE DE	F		165
Uniform Electric Field—Potential Energy of a Negative Charge	F	DE	AB	C		166
	C		DE DE	F		
Uniform Electric Field—Change in Potential Energy of a Positive Charge	F					167
Uniform Electric Field—Change in Potential Energy of a Negative Charge			AB	C		168
Electron Within a Charged Capacitor—Electric Potential Energy	EF	AB	CD			169
DC Circuit Ranking Tasks	~~~~					170
Basic Circuits with Identical Capacitors—Charge on a Capacitor	CDEG	AB	FH			171
Circuits with Identical Capacitors—Charge on a Capacitor	CD	E	AB	FGH		172
Simple Capacitor Circuits—Charge on a Capacitor	DF	CE	AB	GH		173
Basic Circuits with Identical Capacitors—Voltage Across a Capacitor	CDEG	AB	FH			174
Circuits with Resistors and Capacitors—Current	BF	CG	D	ΑE		175
Current Carrying Wires with Different Lengths—Net Charge	All zero					176
Batteries and Bulbs—Bulb Brightness	C	В	ADE			177
Simple Resistor Circuits—Current	C	BE	A	D	F	178
Current Carrying Wires with Different Resistances—Net Charge	All zero	net charg	e			179
Simple Series Circuit—Voltage Across Bulb X	GH	DE	BCF	A		180
Simple Resistor Circuits—Voltage Drop	C	A	BE	F	D	181
Parallel Circuits—Voltmeter Readings Across Open Switches I	D	В	C	A		182
Parallel Circuits—Voltmeter Readings Across Open Switches II		ngs are 3				183
Circuit with Two Open and Closed Switches—Ammeter Readings	D	В	C	A		184
Circuit with Two Open and Closed Switches—Voltmeter Readings	В	A	CD	11		185
	EH BC		D D	F	A	186
Circuit with Three Open and Closed Switches—Voltmeter Readings I						
Circuit with Three Open and Closed Switches—Voltmeter Readings II	F A	G	D	BCEF		187
Circuit with Three Open and Closed Switches—Ammeter Readings	EH BC		D	F	A	188
Simple Series Circuit with Various Resistors—Current I	All same		DEE			189
Simple Series Circuit with Various Resistors—Voltmeter	G	ACD	BEF			190
Magnetism and Electromagnetism Ranking Tasks						205
Moving Charges in Uniform Magnetic Field—Acceleration	GH	EF	CD	AB		206
Moving Charges in Uniform Magnetic Field—Change in Kinetic Energy	All zero					207
Charges Near Magnets—Magnetic Force	All zero					208
Pairs of Long Current Carrying Wires—Magnetic Field	B A	E	DG	C	F	209
Pairs of Equal Current Electromagnets—Force	CE	BD	G	FΗ	Α	210
Pairs of Equal Current Electromagnets— Magnetic Field between	CE	BDH	G	AF		211
Unequal Current Electromagnets— Magnetic Field at Ends	B F	A E	G C	Н	D	212
Electromagnets with Unequal Currents—Magnetic Field between	E B	F D	H A	G	C	213
Graph of Current vs. Time—Induced Current	C	E	В	AD		214
-						