Physics 3204
June 2011 Public Exam Outcome Report

This examination follows the specifications, conventions and standards set out in the:
Physics 3204 Provincial Exam Standards

Units 1 – Force, Motion and Energy
2 – Fields
3 – Matter Energy Interface

PART I: Selected Response—Total Value: 50%

Item	Curriculum Guide Page	Outcome	Cognitive Level	Outcome Description
1	(Unit 1) 28	325-6	L1	Identify an example of projectile motion.
2	28	325-6	L1	Calculate the horizontal component of an initial velocity.
3	28/30	325-6	L2	Calculate the initial speed of a projectile launched horizontally given the horizontal and vertical distance from launch.
4	28	325-6	L1	Find the magnitude of the final velocity of a projectile launched from ground level.
5	28/30	325-6	L2	Calculate the maximum height of a projectile launched at an initial velocity.
6	32	325-8	L1	Find the applied force for an object moving horizontally at a constant velocity.
7	32	325-8	L2	Given a diagram, find an expression for the normal force acting on an object using Newton's laws of motion.
8	34	325-8	L2	Find the coefficient of friction for an object sliding down an inclined plane.
9	34	325-8	L3	Calculate the tension in a string connecting a system of masses with a pulley on a horizontal surface using Newton's laws of motion.
10	44	ACP-1	L2	Calculate the mass of an object in static equilibrium using vector analysis in two dimensions.
11	34	325-8	L2	Given a diagram, calculate the acceleration of a system of masses with a pulley using Newton's laws of motion.
12	36	325-12	L2	Calculate centripetal acceleration using the definition.
13	38	325-13	L2	Find the limiting velocity of an object at the top of a vertical circle.

14	36	325-13	L2	Calculate the centripetal acceleration using the definition.
15	38/42	325-13	L1	Given a diagram, qualitatively analyze the motion of an object travelling in a horizontal circle.
16	40	325-13	L1	Calculate the radius of a banked curve without friction.
17				Item dropped.
18	46	ACP-1	L2	Solve a static equilibrium problem by balancing forces and torques.
19	44	ACP-1	L1	Identify conditions necessary for rotational equilibrium.
20	48	ACP-1	L3	Qualitatively analyze the forces and torques applied on a system in static equilibrium when an applied force changes.
21	(Unit 2) 56	308-13 308-14 308-15	L1	Identify the SI unit of charge.
22	56	308-13 308-14 308-15	L2	Calculate the charge on a body when given the number of excess electrons.
23	60	328-4	L2	Calculate the charge on an object using Coulomb's Law.
24	62	328-1 328-2 328-3	L1	Identify a correct electric field diagram for a point charge.
25	68	328-1 328-2 328-3	L2	Given the electric potential and charge, calculate the work done.
26	72	ACP-3	L1	Calculate the electric current when given the charge passing through a conductor and the time taken.
27	78	ACP-3	L1	Find the total resistance of a parallel circuit.
28	76	ACP-3	L2	Calculate the resistivity of a wire.
29	74	ACP-3	L1	Calculate the voltage drop using Ohm's Law.
30	80	213-8	L1	Identify the correct apparatus to measure a given electrical quantity.
31	80	ACP-3	L2	Find the current using the definition of power.
32	80	ACP-3	L2	Calculate the cost of operating electrical equipment.
33	80	ACP-3	L2	Given a diagram, find the total resistance of a combination circuit.
34	84	328-6	L1	Identify the magnetic field produced by a current-carrying wire.

35	86	328-5	L3	Determine the direction of force on a moving charged particle in a magnetic field created by a current-carrying conductor.
36	82	328-1 328-2	L1	Identify the magnetic field lines surrounding a magnet.
37	86	328-5	L2	Use Left Hand Rule #3 to determine the direction of force on a current-carrying wire in a magnetic field.
38	86	328-5	L2	Calculate the length of a wire placed in a magnetic field.
39	88	328-7	L3	Interpret the current output for a multi loop AC generator.
40	86	328-5	L2	Calculate the speed of a charged particle in a magnetic field.
41	(Unit 3) 96	327-9	L1	Define qualitatively the photoelectric effect.
42	98	327-10	L1	Calculate the energy of electromagnetic radiation.
43	100	115-3	L2	Calculate the wavelength of a photon using Compton's photon momentum equation.
44	108	329-4	L1	Identify the products of radioactive decay.
45	100	115-3	L2	Calculate the mass of an object using de Broglie's Wave Equation.
46	110	329-6	L2	Balance a nuclear reaction.
47	102	329-2	L3	Identify the number of emission lines for a Bohr atom given an energy level diagram.
48	108	329-4	L2	Calculate the energy released in a nuclear reaction using mass defect.
49	108	329-4	L1	Identify an equation for radioactive decay.
50	110	329-6	L2	Find the mass defect in a nuclear reaction given the energy released.

PART II: Constructed Response—Total Value: 50%

Item	Curriculum Guide Page	Outcome	Cognitive Level	Value	Outcome Description
51a	(Unit 1) 28	325-6	L3	3	Determine if an object will hit a target when given the initial velocity.
51b	40	325-13	L2	3	Find the tension at the bottom of a vertical circle.
51c(i)	34	325-8	L2	4	Find the acceleration of a set of blocks on a pulley system on an inclined plane with friction (science communication mark).
51c(ii)	34	325-8	L2	2	Find the tension in the connecting string of the pulley system on an inclined plane with friction.
51d(i)	46	ACP-1	L2	2.5	Calculate the force on a horizontal beam by balancing forces and torques for a system in static equilibrium.
51d(ii)	46	ACP-1	L2	2.5	Calculate a distance on the horizontal beam by balancing forces and torques for a system in static equilibrium.
51e	44	ACP-1	L3	3	Find an unknown quantity when a system of masses is in static equilibrium.
52a	(Unit 2) 56	308-13 308-14 308-15	L2	2	Identify and explain the charges on objects using the law of electric charges when given the method of charging.
52b	60	328-4	L2	3	Calculate the electric force on a charged particle due to the presence of other charges.
52c	64	328-1 328-2 328-3	L3	3	Determine the electric field strength for a charged particle whereby the forces on the particle are balanced.
52d(i)	80	ACP-3	L2	1	Use Ohm's Law and Kirchoff's Law to solve a combination circuit: calculate the total resistance.
52d(ii)	80	ACP-3	L2	2	Use Ohm's Law and Kirchoff's Law to solve a combination circuit: calculate the voltage across a resistor.
52d(iii)	80	ACP-3	L2	1	Use Ohm's Law and Kirchoff's Law to solve a combination circuit: calculate the power dissipated in a resistor.
52e	90/124	118-2 118-4	L2	2	Recognize and identify the impact that a change in distance has on the intensity of radiation that is experienced.

52f	86	328-5	L2	3	Find the current in a wire using Biot's Law (science communication mark).
52g	86	328-5	L3	3	Find the speed of a charged particle moving perpendicularly in a magnetic field generating circular motion.
53a	(Unit 3) 98	327-10	L2	2	Calculate the kinetic energy of an electron by applying the photoelectric effect equation.
53b	108	329-4	L3	3	Using mass defect calculations, explain and justify why the products in a nuclear decay reaction are produced.
53c	110	214-2	L2	3	Find the half-life for a radioactive sample that has decayed (science communication mark).
53d	108	329-4	L2	2	Calculate the energy released in a nuclear reaction using mass defect.