Physics 3204
June 2010 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	Given a diagram, quantitatively analyze the velocity components of a projectile.
2	28	325-6	L1	Given a diagram, qualitatively analyze the horizontal displacement (range) of a projectile.
3	28	325-6	L2	Find the initial speed of a projectile launched horizontally given the vertical and horizontal distance from launch.
4	28	325-6	L2	Calculate the range of a projectile launched from the ground at an angle above the horizontal.
5	28	325-6	L2	Calculate the maximum height reached by a projectile launched above the horizontal.
6	34	325-8	L1	Apply Newton's laws of motion to an object moving horizontally at a constant velocity.
7	32	325-8	L1	Find an expression for the normal force 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 using Newton's laws of motion.
10	34	325-8	L2	Calculate the tension in a string connecting a system of masses on an inclined plane with a pulley.
11	36	325-12	L1	Identify the direction of the centripetal force for an object moving in a horizontal circle.

12	36	325-12	L1	Calculate centripetal acceleration using the definition.
13	38	325-13	L2	Find the velocity of an object at the top of a vertical circle.
14	36	325-12	L2	Calculate the centripetal acceleration using the definition.
15	40	325-13	L1	Find the radius of a banked curve without friction.
16	46	ACP-1	L1	Calculate torque when a force is applied perpendicularly.
17	46	ACP-1	L3	Qualitatively analyze the forces and torques applied on a system in static equilibrium.
18	46	ACP-1	L2	Solve a static equilibrium problem by balancing forces and torques.
19	48	ACP-1	L2	Find the tension in a cable by balancing the torques (or forces) for a system in static equilibrium.
20	44	ACP-1	L2	Find the tension in a wire by balancing the forces for a system in static equilibrium.
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	L1	Calculate the charge on an object given the number of excess electrons.
23	60	328-4	L2	Apply Coulomb's Law quantitatively to calculate the charge on an object.
24	60	328-4	L2	Explain how the force between two charged particles depends on their separation.
25	64	328-1 328-2 328-3	L2	Calculate the electric field strength at a point for a given charge distribution.
26	64	328-1 328-2 328-3	L1	Find the electric field strength in the region of a charged particle.
27	78	ACP-3	L1	Find the effective value of resistance for 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	78	ACP-3	L2	Apply Kirchoff's voltage rule to a circuit.
31	80	ACP-3	L2	Find current using the definition of power.
32	80	ACP-3	L2	Calculate the cost of operating electrical equipment.
33	82	328-1 328-2	L1	Identify the direction of magnetic field lines for a single bar magnet.

34	86	328-5	L2	Using the magnetic field strength a specific distance away from a conductor, find the current.
35	86	328-5	L2	Determine the direction of a moving charged particle's path in a magnetic field.
36	86	328-5	L3	Identify the equation that describes the motion of a charged particle moving perpendicularly in a magnetic field generating circular motion.
37	88	328-7	L1	Determine the direction of the induced current in a solenoid.
38	88	328-7	L1	Determine the direction of the induced current in a wire.
39	88	328-7	L3	Identify the current output for Faraday's Iron Ring apparatus.
40	86	328-5	L2	Find the velocity of a charged particle in a magnetic field.
41	(Unit 3) 96	327-9	L1	Define qualitatively the photoelectric effect.
42	96	327-9	L2	Calculate the frequency of electromagnetic radiation.
43	98	327-10	L2	Explain how the energy of a photon depends on wavelength.
44	100	329-1	L2	Use Compton's photon momentum equation to find wavelength.
45	100	115-3	L2	Use de Broglie's Wave Equation to find the mass of an object.
46	102	329-2	L1	Describe qualitatively how the Bohr model explains atomic spectra.
47	102	329-2	L3	Identify possible emission lines for a Bohr atom.
48	106	327-11	L1	Item dropped.
49	108	329-4	L1	Identify the reaction type for a nuclear reaction.
50	110	326-9	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	L2	4	Calculate the final velocity of a projectile launched horizontally. (science communication mark)
51b	28	325-6	L3	3	A projectile launched at an angle lands at the same height. Compare its motion to that of another moving object.
51c	34	325-8	L2	4	Find acceleration and tension for a box and pulley system on an inclined plane.
51d	36	325-12	L2	2	Explain acceleration for uniform circular motion.
51e	44	ACP-1	L2	4	Find the mass of an object in static equilibrium.
51f	46	ACP-1	L3	3	Find the lever arm for an object by balancing the forces and torques for a system in static equilibrium.
52a	(Unit 2) 60	328-4	L2	4	Calculate the electric force on a charged particle due to the presence of other charges. (science communication mark)
52b	60	328-4	L3	3	Item dropped.
52c	80	ACP-3	L2	5	Use Ohm's Law and Kirchoff's Law to solve a combination circuit.
52d	86	328-5	L3	3	Find the current in a rod in a magnetic field.
52e	86	328-5	L2	2	Find the magnetic field near two current-carrying conductors.
52f	88	328-7	L2	3	Interpret the current output of both AC and DC generators.
53a	(Unit 3) 98	327-10	L3	3	Relate the frequency of the incident light to the work function.
53b	108	329-4	L2	2	Calculate the energy released in a nuclear reaction using mass defect.
53c	110	214-2	L2	3	Find the time for a radioactive sample to decay. (science communication mark)
53d	112	214-15 215-4 215-5	L2	2	Describe the pros and cons of nuclear energy.