Physics 3204
June 2012 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	325-6	L1	Identify the velocity vector of a projectile.
4	28	325-6	L2	Calculate the time in the air given the range and initial velocity of a projectile.
5	30	325-6	L2	Calculate the time for a projectile, launched horizontally, to fall a given distance.
6	32	325-8	L1	Calculate the magnitude of the applied force required to move an object at constant velocity.
7	34	325-8	L2	Calculate the normal force on a box sliding down a frictionless ramp.
8	34	325-8	L2	Calculate the coefficient of kinetic friction on an incline when an object slides down at constant velocity.
9	34	325-8	L3	Calculate the tension in the connecting string for a system of masses with a pulley on the end of a frictionless, horizontal table.
10	44	ACP-1	L2	Calculate the mass of an object in static equilibrium supported by cables at two different angles.
11	34	325-8	L2	Calculate the acceleration of a system of masses with a pulley on a horizontal table with friction.
12	36	325-12	L1	Use a diagram to identify the direction of the velocity, centripetal acceleration and centripetal force for an object in uniform circular motion.

13	38	325-13	L2	Calculate the tension in a rope at the top of a loop when it is swinging an object in a vertical circle.
14	36	325-13	L2	Calculate centripetal acceleration given the radius and period.
15	42	325-13	L3	Identify the change in centripetal force caused by changing the radius of rotation.
16	40	325-13	L1	Calculate the radius of a banked curve without friction.
17	44	ACP-1	L1	Identify the conditions necessary for static equilibrium.
18	46	ACP-1	L2	Solve a static equilibrium problem by balancing torques.
19	44	ACP-1	L1	Identify the center of mass of a uniform object.
20	46	ACP-1	L2	Calculate the torque exerted on an object when a force is applied at an angle.
21	(Unit 2) 56	308-13 308-14 308-15	L2	Given diagrams, identify which electroscope has been charged by induction.
22	62	328-1 328-2 328-3	L1	Identify both charges in an electric field diagram.
23	64	328-1 328-2 328-3	L1	Calculate the magnitude of the electric field strength at a given distance from a single charge.
24	72	ACP-3	L1	Identify a source of electrical energy.
25	68	328-1 328-2 328-3	L2	Calculate the work done given the charge and the electrical potential.
26	72	ACP-3	L1	Calculate current using the defining equation.
27	74	ACP-3	L2	Given diagrams, identify which circuit has the most resistance.
28	76	ACP-3	L2	Calculate resistivity using the defining equation for resistance.
29	74	ACP-3	L1	Calculate voltage using Ohm's Law.
30	76	ACP-3	L1	Identify the voltage vs. current graph for an ohmic resistor.
31	80	ACP-3	L2	Calculate the power dissipated by a resistor in a series circuit.
32	80	ACP-3	L2	Calculate the cost to operate an electrical device for a given period of time.
33	82	328-1,2	L1	Given diagrams, identify the strongest magnet using domain theory.
34	82	328-1,2	L1	Given diagrams, identify the magnetic field around Earth.

35	86	328-5	L3	Determine the direction of the force on a charged particle moving parallel to a current-carrying conductor.
36	86	328-5	L2	Determine the direction of the force on a current-carrying wire placed in a magnetic field.
37	86	328-5	L2	Determine the magnitude and direction of the force on a moving charged particle in a magnetic field.
38	86	328-5	L2	Calculate the length of current-carrying wire that would experience a given force when in a magnetic field.
39	88	328-7	L2	Use Lenz's Law to determine the polarity of a magnet moving into a current-carrying coil.
40	88	328-7	L3	Identify the type and frequency of rotation of a generator when given the graph of current output vs. time.
41	(Unit 3) 98	327-10	L1	Identify the definition of the work function.
42	96	327-9	L1	Calculate the energy of electromagnetic radiation given the frequency.
43	98	327-10	L2	Calculate the wavelength of light that causes electrons to be ejected in a solar cell given the work function and the kinetic energy of the ejected electrons.
44	104	329-3	L2	Calculate the energy released when an electron transitions to a lower energy level.
45	100	115-3	L2	Calculate the mass of an object with a given deBroglie wavelength and speed.
46	108	329-5	L1	Identify a nuclear decay process from one of its products.
47	110	214-2	L3	Use a graph of mass vs. time to determine the half-life of a radioactive sample.
48	110	329-6	L2	Identify the products of a nuclear reaction.
49	112	115-5 117-11	L1	Identify the purpose of one component in the CANDU reactor.
50	110	329-6	L2	Calculate the mass defect in a nuclear reaction given the energy released per atom and the number of atoms that were split.

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 maximum height for a projectile thrown with an initial velocity at an angle above the horizontal from a point above the floor. (science communication mark)
51b(i)	34	325-8	L2	4	Calculate the acceleration of a system of masses with a pulley on a combination horizontal table and incline when friction is present on both surfaces.
51b(ii)	34	325-8	L2	2	Calculate the tension in the connecting string of the system of masses in part 51b(i).
51c	38	325-13	L3	2	Determine if a car can make a turn on a horizontal road at a given speed when the maximum friction is given.
51d	38	325-13	L2	2	Calculate the normal force on an object at the bottom of a vertical circle.
51e	44	ACP-1	L2	2	Calculate the mass of an object in static equilibrium by balancing forces.
51f	46	ACP-1	L3	4	Calculate the mass of an object in static equilibrium by balancing torques when the object is supported at both ends by forces at different angles.
52a	(Unit 2) 56	308-13 308-14 308-15	L2	2	Identify and explain the charges on objects using the laws of electric charges given the method of charging.
52b	60	328-4	L2	4	Calculate the net electric force on a charge due to the presence of two other charges. All charges are co-linear. (science communication mark)
52c(i)	78	ACP-3	L2	1	Solve a combination circuit using Kirchoff's Laws and Ohm's Law – find voltage across a series resistor.
52c(ii)	78	ACP-3	L2	2	Solve a combination circuit using Kirchoff's Laws and a power equation – find power dissipated in a parallel resistor.
52c(iii)	78	ACP-3	L2	2	Solve a combination circuit using Kirchoff's Laws and Ohm's Law – find the current through a parallel resistor.
52d	88	328-7	L3	3	Use Lenz's Law to identify and explain which situation will result in a magnet moving at a slower rate through two different hollow tubes.

52e	86	328-5	L2	3	Calculate the resistance of a length of conductor in a series circuit when it is placed in a uniform magnetic field. (science communication mark)
52f	86	328-5	L3	3	Calculate the magnitude and direction of a current in a wire placed in a magnetic field given the magnetic field strength and direction at a specific distance from the wire.
53a	(Unit 3) 98	327-10	L3	3	Given a graph of kinetic energy vs. frequency and a table of metals and their work functions, determine and explain which metals will eject electrons.
53b	104	329-3	L2	3	Calculate the wavelength of light emitted when an electron transitions to a lower energy level.
53c	110	214-2	L2	2	Calculate the time for a radioactive sample to decay to a specified amount given its half-life.
53d	108	329-4	L2	2	Calculate the energy released in a nuclear reaction given the masses of the particles involved in the reaction.