Physics 3204
June 2013 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 the horizontal speed and vertical acceleration of a projectile.
2	28	325-6	L3	Calculate the initial vertical velocity given the displacement versus time graph for a projectile.
3	28	325-6	L1	Identify the vector representation of a projectile's velocity at maximum height.
4	28	325-6	L2	Calculate the amount of time it takes for a projectile to travel a specified horizontal distance when its initial velocity is above the horizontal.
5	30	See att	L2	Calculate the amount of time it takes for a projectile to fall a given distance when launched horizontally.
6	32	325-8	L1	Identify the force required to maintain constant velocity given the force of friction.
7	34	325-8	L1	Calculate the normal force acting on a box on an incline.
8	34	325-8	L2	Calculate the coefficient of kinetic friction on an incline when an object slides down at constant velocity.

9	32	325-8	L2	Calculate the acceleration of an object moving horizontally given the force applied at an angle above the horizontal and the force of friction.
10	44	See att	L2	Calculate the mass of an object in static equilibrium supported by given tensions at two different angles.
11	34	325-8	L3	Calculate the tension in the connecting string for a system of three masses with a pulley on the end of a frictionless bench.
12	38	325-13	L1	Given a diagram, identify where tension is greatest for an object spun in a vertical circle.
13	38	325-13	L2	Calculate the maximum speed a car can have to remain on the road at the top of a circular path.
14	36	325-12	L2	Calculate centripetal acceleration given period and radius.
15	42	See att	L2	Calculate the centripetal force on an object given mass, radius, number of revolutions and time.
16	40	325-13	L1	Calculate the radius of a banked curve without friction.
17	44	See att	L1	Identify the conditions necessary for static equilibrium.
18	44	ACP-1	L1	Identify the free body diagram for an object in static equilibrium.
19	48	ACP-1	L2	Calculate the force exerted on a uniform ladder by a frictionless wall.
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	L1	Identify what happens to a neutral electroscope when a positively charged object is brought nearby.

22	56	308-13 308-14 308-15	L2	Calculate the charge on an object given its deficiency of electrons.
23	60	328-4	L3	Identify what happens to the electric force between two charged objects when charge and the distance between the objects changes.
24	62	328-1 328-2 328-3	L1	Given diagrams, identify the electric field around a positive charge.
25	68	328-1 328-2 328-3	L2	Calculate the work done on an electron that has been raised to a given potential difference.
26	72	ACP-3	L1	Calculate current given charge and time.
27	78	ACP-3	L2	Given circuit diagrams, identify which circuit has the most resistance.
28	64	328-1 328-2 328-3	L2	Calculate charge given force and electric field strength.
29	74	ACP-3	L1	Calculate voltage using Ohm's Law.
30	76	ACP-3	L1	Identify the voltage versus current graph for an ohmic resistor.
31	80	ACP-3	L2	Calculate the power dissipated by a resistor in a series circuit.
32	76	ACP-3	L2	Calculate a wire's length using the defining equation for resistance.
33	78	ACP-3	L1	Calculate current in a parallel circuit using Kirchoff's Current Law.
34	82	328-1,2	L1	Given diagrams, identify the magnetic field around the earth.
35	84	328-6	L1	Identify the direction of the magnetic field around a straight current-carrying wire.

36	86	328-5	L2	Identify the direction of the force on a current-carrying wire placed in a magnetic field.
37	84	328-6	L2	Determine which direction a compass needle will point when placed at one end of a current-carrying coil of wire.
38	86	328-5	L2	Calculate the length of current-carrying wire that would experience a given force when placed in a magnetic field.
39	88	328-7	L2	Use Lenz's Law to determine the polarity of a magnet and coil when given the direction of induced current in the coil.
40	88	328-7	L3	Identify the type and frequency of rotation of a generator given the graph of its current output versus 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	100	115-3	L1	Calculate the momentum of a photon given its wavelength.
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 given its de Broglie wavelength and speed.
46	108	329-4	L2	Determine the number of neutrons in an atom given the atomic number and atomic mass number.
47	108	329-4	L2	Identify the daughter element in a given nuclear decay reaction.
48	110	326-9	L2	Identify the products of a fission reaction.

49	108	329-4	L3	Identify a radioactive sample given a diagram showing its behaviour in a magnetic field.
50	112	115-5 117-11	L1	Identify the purpose of one of the safety features in the CANDU reactor.

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 height of a projectile launched from ground level at an angle above the horizontal after travelling a given horizontal distance.
51b(i)	34	325-8	L2	3	Calculate the acceleration of a system of masses with a pulley on a combination horizontal table and incline with friction on the table.
51b(ii)	34	325-8	L2	3	Calculate the tension in the connecting string of the system of masses in 51b(i). (Scientific Communication)
51c	38	325-13	L3	3	Calculate the horizontal distance an object travels in a given amount of time after the string that is spinning it in a horizontal circle breaks.
51d	38	325-13	L2	2	Calculate the tension in a rope at the top 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	3	Calculate whether or not a cable supporting a mass will break when the mass is increased by balancing torques.
52a	(Unit 2) 66	328-1 328-2 328-3	L2	4	Calculate the net electric field at a point between two charges.

52b(i)	80	ACP-3	L2	2	Solve a combination circuit – calculate the total current.
52b(ii)	80	ACP-3	L2	2	Solve a combination circuit – calculate the voltage across a parallel resistor.
52b(iii)	80	ACP-3	L2	1	Solve a combination circuit – calculate the power dissipated by a series resistor.
52c	86	328-5	L2	5	Calculate the net magnetic field strength at a point between two parallel current-carrying wires. (Scientific Communication)
52d	88	328-7	L3	3	Use Lenz's Law to explain whether or not two magnets falling through two coils of different materials will reach the bottom at the same time.
52e	86	328-5	L3	3	Calculate the magnitude and direction of current in a wire that is suspended in a magnetic field.
53a(i)	(Unit 3) 98	327-10	L3	1	Create a graph of kinetic energy versus frequency using given data recorded from the photoelectric effect.
53a(ii)	98	327-10	L3	1	Use the graph from 53a(i) to determine the threshold frequency.
53a(iii)	98	327-10	L3	1	Explain how changing the brightness of incident light affects the kinetic energy of ejected electrons.
53b(i)	108	329-4	L2	1	Complete a nuclear decay reaction showing all mass numbers and atomic numbers.
53b(ii)	108	329-4	L2	2	Calculate the energy released in a nuclear decay reaction given the masses of the reactants and products.
53c	110	214-2	L2	4	Calculate the time for a radioactive sample to decay to a specified amount given its half-life. (Scientific Communication)