Physics 3204
June 2015 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
			(Unit 1)	
1	28	325-6	L1	Identify an example of projectile motion.
2	28	325-6	L2	Identify the speed of a projectile at a point on its path.
3	28	325-6	L1	Identify the velocity vector of a projectile at maximum height.
4	30	325-6	L2	Calculate the time of flight of a projectile launched and caught at the same level.
5	30	325-6	L2	Calculate the time for a projectile, launched horizontally, to reach the floor.
6	32	325-8	L1	Identify the force required to move an object at constant velocity.
7	32	325-8	L3	Calculate the mass of an object given its acceleration and the vertical component of the applied force.
8	34	325-8	L2	Calculate the acceleration of a system of masses with a pulley at the end of a frictionless horizontal surface.
9	34	325-8	L2	Calculate the parallel and perpendicular components of the force exerted by a box on an incline.
10	44	ACP-1	L2	Calculate the mass of an object in static equilibrium that is supported by two different tensions.
11	34	325-8	L2	Calculate the force of friction acting on an object sliding down an incline at constant velocity given its mass.
12	34	325-8	L1	Identify the free body diagram for an object at rest on an incline.
13	34	325-8	L2	Given a diagram, identify the force applied on an object to keep it at rest on an incline.

14	36	324-12	L2	Calculate the centripetal acceleration of an object given its period and the radius of the path.
15	36	325-12	L1	Calculate the centripetal force acting on an object given its mass, speed and the radius of the path.
16	38	325-13	L3	Identify the expression for the minimum speed of an object at the top of a vertical circle
17	40	325-13	L2	Calculate the maximum speed of a car on a banked curve given the radius and banking angle of the path.
18	44	213-5	L2	Calculate the tension in one of the ropes that supports a mass given the tension in the second supporting rope.
19	44	ACP-1	L1	Identify the formula for torque.
20	44	ACP-1	L1	Calculate the torque produced given the force and the distance from the pivot point.
21	56	308-14	(Unit 2) L2	Identify what happens to a neutral metal ball when a negatively charged rod is brought nearby.
22	56	308-13	L1	Identify the SI unit for charge.
23	56	308-13	L2	Calculate the number of excess electrons on an object given its charge.
24	60	328-4	L2	Calculate the distance between two charges given the electric force between them.
25	62	328-1	L1	Identify the direction of the electric field lines between two equal and like charges.
26	72	ACP-3	L1	Calculate current given charge and time.
27	64	328-1	L2	Calculate the force experienced by a charge given the charge and the electric field strength.
28	76	ACP-3	L1	Identify the voltage versus current graph for a linear circuit element.
29	76	ACP-3	L1	Identify the SI unit for resistivity.
30	76	ACP-3	L3	Determine which of two resistors dissipates the greater power in a series and parallel circuit given the resistivity of each resistor.
31	78	ACP-3	L1	Calculate the current in a parallel circuit.
32	78	ACP-3	L2	Calculate the total resistance of three resistors connected in parallel.
33	80	ACP-3	L2	Calculate the voltage across a resistor given it resistance and the power it dissipates.
34	82	328-1	L1	Identify how the direction of magnetic field lines is determined.
35	82	328-1,2	L1	Identify the magnetic field of a horseshoe magnet.

36	84	328-6	L2	Determine the magnetic field direction above and below a straight current-carrying conductor.
37	84	328-6	L1	Identify a characteristic that determines the strength of an electromagnet.
38	86	328-5	L2	Calculate the length of wire that experiences a given force when placed in a given magnetic field.
39	88	328-7	L2	Use Lenz's Law to determine which diagram shows the correct polarity of a coil of wire and a moving magnet.
40	86	328-5	L3	Determine what change must be made to a magnetic field in order to make a stream of electrons, when shot into the field, hit a target.
41	98	327-10	(Unit 3) L1	Identify the definition of work function.
42	98	327-10	L1	Convert energy in Joules into electronvolts.
43	100	329-1	L2	Calculate the wavelength of a photon given its momentum.
44	104	329-3	L2	Calculate the energy released when an electron drops to lower energy level in a Hydrogen atom.
45	100	329-1	L2	Calculate the mass of an object given its speed and deBroglie wavelength.
46	108	329-4	L1	Identify a transmutation given the decay reaction.
47	108	329-4	L2	Identify a reaction as fission or fusion and determine the number of neutrons in the products.
48	110	329-6	L2	Determine the missing product in a given fission reaction.
49	110	214-2	L3	Determine the half-life of a sample given the activity levels and the time passed.
50	112	315-5	L1	Identify a characteristic of the CANDU reactor.

PART II: Constructed Response—Total Value: 50%

Item	Curriculum Guide Page	Outcome	Cognitive Level	Value	Outcome Description
51a	34	325-6	(Unit 1) L3	4	Calculate if a projectile will hit a target given the horizontal distance away and its initial velocity. The launch point and target are not at the same level.
51b	34	325-8	L2	3+1	Calculate the acceleration of a system of masses with a pulley on a combination horizontal table and incline with friction on the table. (science communication mark)
51c	34	325-8	L3	2	Calculate the normal force acting on an object sliding down an incline when a force is applied horizontal to the ground.
51d	38	325-13	L2	2	Calculate the normal force at the bottom of a vertical circle.
51e	44	ACP-1	L2	2	Calculate the mass of an object in static equilibrium that is supported by two tensions at the same angle.
51f	38	325-13	L2	3	Calculate the tension in the string attached to an object travelling in a horizontal circle given the time for several rotations.
51g	46	ACP-1	L2	3	Calculate the forces exerted on a uniform beam by its two supports.
52a(i)	56	328-1	(Unit 2) L3	2	Calculate the electric field strength necessary to hold a charged particle stationary between two charged plates.
52a(ii)	56	328-1	L3	1	Determine the charge on one of the plates.
52b	64	328-1	L2	3+1	Calculate the electric field strength at a given distance from two charges that are along a straight line. (science communication mark)
52c(i)	78	ACP-3	L2	1	Solve a combination circuit - calculate the voltage across a series resistor.
52c(ii)	78	ACP-3	L2	2	Solve a combination circuit – calculate the power dissipated by a parallel resistor.
52c(iii)	78	ACP-3	L2	2	Solve a combination circuit – calculate the current flowing through a parallel resistor.
52d	78-80	ACP-3	L2	2	Calculate the cost to operate an appliance for a period of time given current, resistance and the price per kW·h.
52e	82	328-6	L3	3	Use Lenz's Law to determine the direction of current induced in a coil of wire. Explain why the current direction changes when the magnet enters and then exits the coil.

52f	86	328-5	L2	3	Calculate the magnitude and direction of current in a straight current-carrying wire given the magnetic field strength at a given distance from the wire.
53a	98	327-10	(Unit 3) L3	3	Use a graph of maximum kinetic energy versus frequency to determine which metals, when illuminated by the same light as depicted in the graph, will eject electrons given the work function of each metal.
53b	100	329-3	L2	2	Calculate the energy gained when an electron transitions from one energy level to another in a hydrogen atom.
53c	108	214-2	L2	2+1	Calculate the original amount of a substance given its half-life and the amount remaining after it has decayed for a given amount of time. (science communication mark)
53d	108	329-4	L2	2	Calculate the energy released in a nuclear decay reaction given the masses of the reactants and products.