



Republic of the Philippines
Department of Education
CARAGA REGION

**TABLE OF SPECIFICATION FOR THE DIAGNOSTIC TEST IN GENERAL PHYSICS 2
SY 2022-2023**

MOST ESSENTIAL LEARNING COMPETENCIES	No. of days based on LC Codes	%	No. of Items	Lower-order Thinking Skills		Moderate-order Thinking Skills		Higher-order Thinking Skills	
				Rem	Und	App	Ana	Eval	Cre
				Item Placement					
Describe using a diagram charging by rubbing and charging by induction. (STEM_GP12EMIIIa-1)	4	7%	4	1**					
Explain the role of electron transfer in electrostatic charging by rubbing. (STEM_GP12EMIIIa-2)									
Describe experiments to show electrostatic charging by induction. (STEM_GP12EMIIIa-3)									
Calculate the net electric force on a point charge exerted by a system of point charges. (STEM_GP12EMIIIa-6)					2***				
Describe an electric field as a region in which an electric charge experiences a force. (STEM_GP12EMIIIa-7)						3***		4***	
Calculate the electric field due to a system of point charges using Coulomb's law and the Superposition Principle. (STEM_GP12EMIIIa-10)									
Calculate electric flux. (STEM_GP12EMIIIb-12)	4	6%	3				5*		
Use Gauss's law to infer electric field due to uniformly distributed charges on long wires, spheres, and large plates. (STEM_GP12EMIIIb-13)					6**				
Solve problems involving electric charges, dipoles, forces, fields, and flux in contexts such as, but not limited to, systems of point charges,								7***	



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electrical breakdown of air, charged pendulums, electrostatic ink-jet printer. (STEM_GP12EMIIIb-14).									
Relate the electric potential with work, potential energy, and electric field. (STEM_GP12EM-IIIb-15)	4	7%	4	8**					
Determine the electric potential with work, potential energy, and electric field. (STEM_GP12EM-IIIb-17)									
Infer the direction and strength of electric field vector, nature of the electric field sources, and electrostatic potential surfaces given the equipotential lines. (STEM_GP12EM-IIIc-18)					9**				
Calculate the electric field in the region given a mathematical function describing its potential in a region of space. (STEM_GP12EM-IIIc-20)						10**			
Solve problems involving electric potential energy and electric potentials in contexts such as, but not limited to, electron guns in CRT TV picture tubes and Van de Graaff generators. (STEM_GP12EM-IIIc-22)								11*	
Deduce the effects of simple capacitors (e.g., parallel-plate, spherical, cylindrical) on the capacitance, charge, and potential difference when the size, potential difference, or charge is changed. (STEM_GP12EM-IIIc-23)	4	7%	3		12**				
Calculate the equivalent capacitance of a network of capacitors connected in series/parallel. (STEM_GP12EM-IIIc-24)							13*		
Determine the total charge, the charge on, and the potential difference across each capacitor in the network given the capacitors connected in series/parallel. (STEM_GP12EM-IIId-25)									
Determine the potential energy stored inside the capacitor given the geometry and the potential difference across the capacitor. (STEM_GP12EM-IIId-26)									
Describe the effects of inserting dielectric materials on the capacitance, charge, and electric field of a capacitor. (STEM_GP12EM-IIId-29)									
Solve problems involving capacitors and dielectrics in contexts such as, but not limited to, charged plates, batteries, and camera flashlamps. (STEM_GP12EM-IIId-30)								14*	

Distinguish between conventional current and electron flow. (STEM_GP12EMIIId-32)	4	7%	3	15**					
Apply the relationship charge = current x time to new situations or to solve related problems. (STEM_GP12EMIIIe-33)									
Describe the effect of temperature increase on the resistance of a metallic conductor. (STEM_GP12EMIIIe36)						16***			
Describe the ability of a material to conduct current in terms of resistivity and conductivity. (STEM_GP12EMIIIe36)									
Apply the relationship of the proportionality between resistance and the length and cross-sectional area of a wire to solve problems. (STEM_GP12EMIIIe-37)								17*	
Differentiate ohmic and non-ohmic materials in terms of their I-V curves. (STEM_GP12EMIIIe-38)	4	7%	3		18**				
Differentiate emf of a source and potential difference (PD) across a circuit. (STEM_GP12EMIIIe-40)									
Given an emf source connected to a resistor, determine the power supplied or dissipated by each element in a circuit. (STEM_GP12EMIII3-42)						19*			
Solve problems involving current, resistivity, resistance, and Ohm's law in contexts such as, but not limited to, batteries and bulbs, household wiring, and selection of fuses. (STEM_GP12EMIII-44)								20*	
Operate devices for measuring currents and voltages. (STEM_GP12EMIIIe-45)	4	6%	3	21*					
Draw circuit diagrams with power sources (cell or battery), switches, lamps, resistors (fixed and variable) fuses, ammeters and voltmeters. (STEM_GP12EMIIIf-47)									
Evaluate the equivalent resistance, current, and voltage in a given network of resistors connected in series and/or parallel. (STEM_GP12EMIIIf-48)							22*		
Calculate the current and voltage through and across circuit elements using Kirchhoff's loop and junction rules (at most 2 loops only). (STEM_GP12EMIIIf-49)								23***	

Solve problems involving the calculation of currents and potential difference in circuits consisting of batteries, resistors and capacitors. (STEM_GP12EMIIIg-51)									
Differentiate electric interactions from magnetic interactions. (STEM_GP12EMIIIh-54)	4	7%	3	24**					
Evaluate the total magnetic flux through an open surface. (STEM_GP12EMIIIh-55)							25***		
Describe the motion of a charged particle in a magnetic field in terms of its speed, acceleration, cyclotron radius, cyclotron frequency, and kinetic energy. (STEM_GP12EMIIIh-58)									
Evaluate the magnetic force on an arbitrary wire segment placed in a uniform magnetic field. (STEM_GP12EMIIIh-59)								26***	
Evaluate the magnetic field vector at a given point in space due to a moving point charge, an infinitesimal current element, or a straight current-carrying conductor. (STEM_GP12EMIIIh-60)	4	7%	3		27***				
Calculate the magnetic field due to one or more straight wire conductors using the superposition principle. (STEM_GP12EMIIIi-62)									
Calculate the force per unit length on a current carrying wire due to the magnetic field produced by other current-carrying wires. (STEM_GP12EMIIIi-63)							28**		
Evaluate the magnetic field vector at any point along the axis of a circular current loop. (STEM_GP12EMIIIi-64)								29**	
Solve problems involving magnetic fields, forces due to magnetic fields and the motion of charges and current-carrying wires in contexts such as, but not limited to, determining the strength of Earth's magnetic field, mass spectrometers, and solenoids. (STEM_GP12EMIIIi-66)									
Identify the factors that affect the magnitude of the induced emf and the magnitude and direction of the induced current (Faraday's Law) (STEM_GP12EMIVa-1)	4	6%	3						
Compare and contrast electrostatic electric field and non-electrostatic/induced electric field (STEM_GP12EMIVa-3)					30**				
Calculate the induced emf in a closed loop due to a time-varying magnetic flux using Faraday's Law (STEM_GP12EMIVa-4)								31***	

Describe the direction of the induced electric field, magnetic field, and current on a conducting/nonconducting loop using Lenz's Law (STEM_GP12EMIVa-5)						32**			
Compare and contrast alternating current (AC) and direct current (DC) (STEM_GP12EMIVb-6)	4	7%	4	33***					
Characterize the properties (stored energy and time-dependence of charges, currents, and voltages) of an LC circuit (STEM_GP12EMIVb-8)									
Relate the properties of EM wave (wavelength, frequency, speed) and the properties of vacuum and optical medium (permittivity, permeability, and index of refraction) (STEM_GP12OPTIVb-12)					34**				
Explain the conditions for total internal reflection (STEM_GP12OPTIVb-14)							35***		
Explain the phenomenon of dispersion by relating to Snell's Law (STEM_GP12OPTIVb-16)									
Calculate the intensity of the transmitted light after passing through a series of polarizers applying Malus's Law (STEM_GP12OPTIVc-18)									
Solve problems involving reflection, refraction, dispersion, and polarization in contexts such as, but not limited to, (polarizing) sunglasses, atmospheric haloes, and rainbows (STEM_GP12OPTIVc-21)								36*	
Explain image formation as an application of reflection, refraction, and paraxial approximation (STEM_GP12OPTIVd-22)	4	7%	4	37**					
Determine the graphically and mathematically the type (virtual/real), magnification, location and orientation of image of a point and extended object produced by a plane or spherical mirror. (STEM_GP12OPTIVd-24)					38**				
Determine graphically and mathematically the type (virtual/real), magnification, location/apparent depth, and orientation of image of a point and extended object produced by a lens or series of lenses. (STEM_GP12OPTIVd-27)							39*		
Apply the principles of geometric optics to discuss image formation by the eye, and correction of common vision defects. (STEM_GP12OPTIVd-28)								40***	

Determine the condition (superposition, path and phase difference, polarization, amplitude) for interference to occur emphasizing the properties of a laser as a monochromatic and coherent light source. (STEM_GP12OPTIVf-32)	4	6%	3	41**					
Relate the geometry of the two-slit experiment set up (slit separation, and screen-to-slit distance) and properties of light (wavelength) to the properties of the interference pattern (width, location, and intensity). (STEM_GP12OPTIVf-33)						42**			
Relate the geometry of the diffraction experiment setup (slit separation, and screen-to-slit distance) and properties of light (wavelength) to the properties of the diffraction pattern (width, location, and intensity of the fringes). (STEM_GP12OPTIVf-35)								43*	
State the postulates of Special Relativity and their consequences. (STEM_GP12MPIVg-39)	8	13%	7	44*	45**				
Apply the time dilation, length contraction and relativistic velocity addition to worded problems. (STEM_GP12MPIVg-40-41)					46**				
Calculate the kinetic energy, rest energy, momentum, and speed of objects moving with speeds comparable to the speed of light. (STEM_GP12MPIVg-42)						47***			
Explain the photoelectric effect using the idea of light quanta or photons. (STEM_GP12MPIVh-45)							48**		
Explain qualitatively the properties of atomic emission and absorption spectra using the concept of energy levels. (STEM_GP12MPIVh-46)								49*	
Calculating radioisotope activity using the concept of half-life. (STEM_GP12MPIVh-i47)								50*	
Total	60	100%	50	9	11	7	8	15	

Legend: *Problem Solving; **Information Literacy; ***Critical Thinking

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