

NAME OF THE DEPARTMENT -SCIENCE														SYLLABUS BREAK UP 2021-22 -AJI	
Name of the Subject Teacher:- LEKSHMI CHANDRAN				Grade:- 12											
MONTH	WEEK	Unit/Section	No of Periods	Topic Break Down / for Periods/Learning objectives / progression	Learning Outcomes/ Skills acquired	Activities (Formative assessment tasks, projects, Visits) INCLUDING VIRTUAL LEARNING	Teaching Aids / Reference/ Resources	Competencies and Values	MY IDENTITY	Cross curricular link	Artificial Intelligence	Critical Thinking Questions- Descriptive	Critical Thinking Questions- Objective		
APRIL	1st week	Electrostatics	24	<ul style="list-style-type: none"> To know Electric Charges; Conservation of charge To analyse Coulomb's law-force between two point charges, forces between multiple charges To explain superposition principle and continuous charge distribution. 	<p>STUDENTS WILL BE ABLE TO</p> <ul style="list-style-type: none"> explain Electric Charges; Conservation of charge analyse Coulomb's law-force between two point charges, forces between multiple charges explain superposition principle and continuous charge distribution. <p>through research,by solving HOT questions, related numerical and by addressing open ended questions</p>	<ul style="list-style-type: none"> Group discussion Experiments Project Differentiated Worksheets Power point presentation 	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	<p>Competencies:Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness</p> <p>Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance</p>	Identify different electric power plants in U A E	Englishspeaking and communication skills, interpreting datas Social studieslife story of scientists, mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm	story about electric power plants and how they distribute electrical energy using story speaker Link to install Story Speaker extension for Story Speaker: https://chrome.google.com/webstore/detail/story-speaker/ohfibhfhbkfndkipjopbneqkbbjpi	1) The electron and proton of a hydrogen atom are separated (on the average) by a distance of about 5.3×10^{-11} m. (a) Find the magnitudes of the electric force and the gravitational force that each particle exerts on the other, and the ratio of the electric force F_e to the gravitational force F_g . (b) Compute the acceleration caused by the electric force of the proton on the electron. Repeat for the gravitational acceleration. 2) (a) Find the magnitude of the electric force between two protons separated by 1 femtometer (10^{-15} m), approximately the distance between two protons in the nucleus of a helium atom. (b) If the protons were not held together by the strong nuclear force, what would be their initial acceleration due to the electric force between them? 3)Three charges lie along the x-axis as in Figure. The positive charge $q_1 = 5.0 \mu\text{C}$ is at $x = 2.0$ m, and the positive charge $q_2 = 5.0 \mu\text{C}$ is at the origin. Where must a negative charge q_3 be placed on the x-axis so that the resultant electric force on it is zero? 4) Consider three point charges at the corners of a triangle, as shown in Figure 15.8, where $q_1 = 5.0 \mu\text{C}$, $q_2 = 2.0 \mu\text{C}$, and $q_3 = 5.0 \mu\text{C}$. (a) Find the components of the force F_{13} exerted by q_1 on q_3 . (b) Find the components of the force F_{23} exerted by q_2 on q_3 . (c) Find the resultant force on q_3 , in terms of components and also in terms of magnitude and direction. 5) Charge $q_1 = 5.0 \mu\text{C}$ is at the origin, and charge $q_2 = 25.0 \mu\text{C}$ is on the x-axis, 0.300 m from the origin (Fig. 15.12). (a) Find the magnitude and direction of the electric field at point P, which has coordinates $(0, 0.400)$ m. (b) Find the force on a charge of $2.00 \mu\text{C}$ placed at P. 6)	1) A suspended object A is attracted to a neutral wall. It's also attracted to a positively charged object B. Which of the following is true about object A? (a) It is uncharged. (b) It has a negative charge. (c) It has a positive charge. (d) It may be either charged or uncharged. 2) Object A has a charge of $12 \mu\text{C}$, and object B has a charge of $16 \mu\text{C}$. Which statement is true? [OPTIONS] 3) A test charge of $13 \mu\text{C}$ is at a point P where the electric field due to other charges is directed to the right and has a magnitude of 4.3×10^6 N/C. If the test charge is replaced with a charge of $23 \mu\text{C}$, the electric field at P (a) has the same magnitude as before, but changes direction, (b) increases in magnitude and changes direction, (c) remains the same, or (d) decreases in magnitude and changes direction. 4) A circular ring of charge of radius b has a total charge q uniformly distributed around it. Find the magnitude of the electric field in the center of the ring. [OPTIONS] 5) A "free" electron and a "free" proton are placed in an identical electric field. Which of the following statements are true? (a) Each particle is acted upon by the same electric force and has the same acceleration. (b) The electric force on the proton is greater in magnitude than the electric force on the electron, but in the opposite direction. (c) The electric force on the proton is equal in magnitude to the electric force on the electron, but in the opposite direction. (d) The magnitude of the acceleration of the electron is greater than that of the proton. (e) Both particles have the same acceleration. 6) Rank the magnitudes of the electric field at points A, B, and C in Figure with the largest magnitude first. (a) A, B, C (b) A, C, B (c) C, A, B (d) The answer can't be determined by visual INSPECTION.		
	2nd week	Electrostatics		<ul style="list-style-type: none"> To understand Electric field, electric field due to a point charge, electric field lines, To explain electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field. To understand Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside). 	<p>STUDENTS WILL BE ABLE TO</p> <ul style="list-style-type: none"> understand Electric field, electric field due to a point charge, electric field lines, explain electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field. understand Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside),through research,by solving HOT questions, related numerical and by addressing open ended questions 	<ul style="list-style-type: none"> Group discussion Experiments Project Differentiated Worksheets Power point presentation 	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	<p>Competencies:Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness</p> <p>Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance</p>	Identify different electric power distribution companies in U A E	Englishspeaking and communication skills, interpreting datas Social studieslife story of scientists, mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm	Introduction to Story Speaker: https://www.youtube.com/watch?v=wsrzvYVyhH8&feature=youtu.be	1) The electron and proton of a hydrogen atom are separated (on the average) by a distance of about 5.3×10^{-11} m. (a) Find the magnitudes of the electric force and the gravitational force that each particle exerts on the other, and the ratio of the electric force F_e to the gravitational force F_g . (b) Compute the acceleration caused by the electric force of the proton on the electron. Repeat for the gravitational acceleration. 2) (a) Find the magnitude of the electric force between two protons separated by 1 femtometer (10^{-15} m), approximately the distance between two protons in the nucleus of a helium atom. (b) If the protons were not held together by the strong nuclear force, what would be their initial acceleration due to the electric force between them? 3)Three charges lie along the x-axis as in Figure. The positive charge $q_1 = 5.0 \mu\text{C}$ is at $x = 2.0$ m, and the positive charge $q_2 = 5.0 \mu\text{C}$ is at the origin. Where must a negative charge q_3 be placed on the x-axis so that the resultant electric force on it is zero? 4) Consider three point charges at the corners of a triangle, as shown in Figure 15.8, where $q_1 = 5.0 \mu\text{C}$, $q_2 = 2.0 \mu\text{C}$, and $q_3 = 5.0 \mu\text{C}$. (a) Find the components of the force F_{13} exerted by q_1 on q_3 . (b) Find the components of the force F_{23} exerted by q_2 on q_3 . (c) Find the resultant force on q_3 , in terms of components and also in terms of magnitude and direction. 5) Charge $q_1 = 5.0 \mu\text{C}$ is at the origin, and charge $q_2 = 25.0 \mu\text{C}$ is on the x-axis, 0.300 m from the origin (Fig. 15.12). (a) Find the magnitude and direction of the electric field at point P, which has coordinates $(0, 0.400)$ m. (b) Find the force on a charge of $2.00 \mu\text{C}$ placed at P. 6)	1) A suspended object A is attracted to a neutral wall. It's also attracted to a positively charged object B. 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Which of the following statements are true? (a) Each particle is acted upon by the same electric force and has the same acceleration. (b) The electric force on the proton is greater in magnitude than the electric force on the electron, but in the opposite direction. (c) The electric force on the proton is equal in magnitude to the electric force on the electron, but in the opposite direction. (d) The magnitude of the acceleration of the electron is greater than that of the proton. (e) Both particles have the same acceleration. 6) Rank the magnitudes of the electric field at points A, B, and C in Figure with the largest magnitude first. (a) A, B, C (b) A, C, B (c) C, A, B (d) The answer can't be determined by visual INSPECTION.		
	3rd week	Electrostatics		<ul style="list-style-type: none"> To analyze Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; To understand equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field. 	<p>STUDENTS WILL BE ABLE TO</p> <ul style="list-style-type: none"> analyze Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; understand equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field. <p>through research,by solving HOT questions, related numerical and by addressing open ended questions</p>	<ul style="list-style-type: none"> Group discussion Experiments Project Differentiated Worksheets Power point presentation 	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	<p>Competencies:Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness</p> <p>Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance</p>	How will you conserve electricity and how is it important for the future of U A E	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.	Google map in determining electric power distribution companies and the techniques used for finding out the amount of electric power consumed by the people in UAE Rule Based AI App.students to go to https://maps.google.com and enter a specific source and destination.	1) The amount of charge that passes through the filament of a certain lightbulb in 2.00 s is 1.67 C. Find (a) the average current in the lightbulb and (b) the number of electrons that pass through the filament in 5.00 s. (c) If the current is supplied by a 12.0 V battery, what total energy is delivered to the lightbulb filament during 2.00 s? What is the average power? 2) copper wire of cross-sectional area 3.00×10^{-6} m ² carries a current of 10.0 A. (a) Assuming each copper atom contributes one free electron to the metal, find the drift speed of the electrons in this wire. (b) Use the ideal gas model to compare the drift speed with the random rms speed an electron would have at 20.0°C . The density of copper is 8.92 g/cm ³ , and its atomic mass is 63.5 u. 3) As a lightbulb ages, why does it give off less light than when new? 4) (a) Calculate the resistance per unit length of a 22 -gauge Nichrome wire of radius 0.321 mm. (b) If a potential difference of 10.0 V is maintained across a 1.00 -m length of the Nichrome	1) Consider positive and negative charges all moving horizontally with the same speed through the four regions in Figure 17.2. Rank the magnitudes of the currents in these four regions from lowest to highest. (1a is the current in Figure 17.2a, 1b the current in Figure 17.2b, etc.) (a) 1d, 1a, 1c, 1b (b) 1a, 1c, 1b, 1d (c) 1c, 1a, 1d, 1b (d) 1d, 1b, 1c, 1a (e) 1a, 1b, 1c, 1d (f) None of these 2) True or False: The drift velocity in a wire of a given composition is inversely proportional to the number density of charge carriers. 3) Suppose a current-carrying wire has a cross-sectional area that gradually becomes smaller along the wire so that the wire has the shape of a very long, truncated cone. How does the drift speed vary along the wire? (a) It slows down as the cross section becomes smaller. (b) It speeds up as the cross section becomes smaller. (c) It doesn't change. (d) More information is needed. 4) Look at the four "circuits" shown in Figure 17.6 and select those that will light the bulb. Circuit		
	4th week	Electrostatics		<ul style="list-style-type: none"> To understand Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, To explain capacitors and capacitance, combination of capacitors in series and in parallel, To understand capacitance of a parallel plate capacitor with and without dielectric medium between the plates, To explain energy stored in a capacitor 	<p>STUDENTS WILL BE ABLE TO</p> <ul style="list-style-type: none"> understand Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, explain capacitors and capacitance, combination of capacitors in series and in parallel,through research,by solving HOT questions, related numerical and by addressing open ended questions understand capacitance of a parallel plate capacitor with and without dielectric medium between the plates, explain energy stored in a capacitor through research,by solving HOT questions, related numerical and by addressing open ended questions 	<ul style="list-style-type: none"> Group discussion Experiments Project Differentiated Worksheets Power point presentation 	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	<p>Competencies:Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness</p> <p>Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance</p>	How will you conserve electricity and how is it important for the future of U A E	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.	Data representation and analysis An online open-source website is available at https://datavizcatalogue.com where the students can observe various types of representations that can be used in data visualization.	1) The amount of charge that passes through the filament of a certain lightbulb in 2.00 s is 1.67 C. Find (a) the average current in the lightbulb and (b) the number of electrons that pass through the filament in 5.00 s. (c) If the current is supplied by a 12.0 V battery, what total energy is delivered to the lightbulb filament during 2.00 s? What is the average power? 2) copper wire of cross-sectional area 3.00×10^{-6} m ² carries a current of 10.0 A. (a) Assuming each copper atom contributes one free electron to the metal, find the drift speed of the electrons in this wire. (b) Use the ideal gas model to compare the drift speed with the random rms speed an electron would have at 20.0°C . The density of copper is 8.92 g/cm ³ , and its atomic mass is 63.5 u. 3) As a lightbulb ages, why does it give off less light than when new? 4) (a) Calculate the resistance per unit length of a 22 -gauge Nichrome wire of radius 0.321 mm. (b) If a potential difference of 10.0 V is maintained across a 1.00 -m length of the Nichrome	1) Consider positive and negative charges all moving horizontally with the same speed through the four regions in Figure 17.2. Rank the magnitudes of the currents in these four regions from lowest to highest. (1a is the current in Figure 17.2a, 1b the current in Figure 17.2b, etc.) (a) 1d, 1a, 1c, 1b (b) 1a, 1c, 1b, 1d (c) 1c, 1a, 1d, 1b (d) 1b, 1c, 1a (e) 1a, 1b, 1c, 1d (f) None of these 2) True or False: The drift velocity in a wire of a given composition is inversely proportional to the number density of charge carriers. 3) Suppose a current-carrying wire has a cross-sectional area that gradually becomes smaller along the wire so that the wire has the shape of a very long, truncated cone. How does the drift speed vary along the wire? (a) It slows down as the cross section becomes smaller. (b) It speeds up as the cross section becomes smaller. (c) It doesn't change. (d) More information is needed. 4) Look at the four "circuits" shown in Figure 17.6 and select those that will light the bulb. Circuit		
1st week	Current Electricity		<ul style="list-style-type: none"> To understand Electric current, flow of electric charges in a metallic conductor, Explain drift velocity, mobility and theirrelation with electric current; drift velocity, mobility and theirrelation with electric current; 	<p>STUDENTS WILL BE ABLE TO</p> <ul style="list-style-type: none"> understand Electric current, flow of electric charges in a metallic conductor, Explain drift velocity, mobility and theirrelation with electric current; through research,by solving HOT questions, related numerical and by addressing open ended questions 	<ul style="list-style-type: none"> Group discussion Experiments Project Differentiated Worksheets Power point presentation 	Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	<p>Competencies:Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness</p> <p>Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance</p>	What suggestions do you have to enhance the efficient utilisation of electrical energy in U A E.	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.		1) The amount of charge that passes through the filament of a certain lightbulb in 2.00 s is 1.67 C. Find (a) the average current in the lightbulb and (b) the number of electrons that pass through the filament in 5.00 s. (c) If the current is supplied by a 12.0 V battery, what total energy is delivered to the lightbulb filament during 2.00 s? What is the average power? 2) copper wire of cross-sectional area 3.00×10^{-6} m ² carries a current of 10.0 A. (a) Assuming each copper atom contributes one free electron to the metal, find the drift speed of the electrons in this wire. (b) Use the ideal gas model to compare the drift speed with the random rms speed an electron would have at 20.0°C . The density of copper is 8.92 g/cm ³ , and its atomic mass is 63.5 u. 3) As a lightbulb ages, why does it give off less light than when new? 4) (a) Calculate the resistance per unit length of a 22 -gauge Nichrome wire of radius 0.321 mm. (b) If a potential difference of 10.0 V is maintained across a 1.00 -m length of the Nichrome	1) Consider positive and negative charges all moving horizontally with the same speed through the four regions in Figure 17.2. Rank the magnitudes of the currents in these four regions from lowest to highest. (1a is the current in Figure 17.2a, 1b the current in Figure 17.2b, etc.) (a) 1d, 1a, 1c, 1b (b) 1a, 1c, 1b, 1d (c) 1c, 1a, 1d, 1b (d) 1b, 1c, 1a (e) 1a, 1b, 1c, 1d (f) None of these 2) True or False: The drift velocity in a wire of a given composition is inversely proportional to the number density of charge carriers. 3) Suppose a current-carrying wire has a cross-sectional area that gradually becomes smaller along the wire so that the wire has the shape of a very long, truncated cone. How does the drift speed vary along the wire? (a) It slows down as the cross section becomes smaller. (b) It speeds up as the cross section becomes smaller. (c) It doesn't change. (d) More information is needed. 4) Look at the four "circuits" shown in Figure 17.6 and select those that will light the bulb. Circuit			

May	2nd week	Current Electricity	<p>To understand Ohm's law, electrical resistance, V-I characteristics (linear and nonlinear), electrical energy and power, electrical resistivity and conductivity.</p> <p>• To explain Carbon resistors, colourcode for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance.</p>	<p>STUDENTS WILL BE ABLE TO understand Ohm's law, electrical resistance, V-I characteristics (linear and nonlinear), electrical energy and power, electrical resistivity and conductivity.</p> <p>• explain Carbon resistors, colourcode for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance.</p> <p>through research, by solving HOT questions, related numerical and by addressing open ended questions</p>	<p>Group discussion</p> <p>• Experiments</p> <p>• Project</p> <p>• Differentiated Worksheets</p> <p>• Power point presentation</p>	<p>Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.</p>	<p>Competencies: Communication, problem solving digital competence, critical thinking, collaboration, cultural awareness, creativity and innovation, independent learning, leadership and responsibility, self confidence, innovation and self direction, global and environmental awareness</p> <p>Values: Respect, integrity, empathy, resilience, honesty, care, tolerance</p>	<p>Give examples of alternative sources of energy that are suitable for U A E</p>	<p>Englishspeaking and communication skills, interpreting data mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.</p>	<p>Talk about the different alternative sources of energy suitable for the supply of electric current</p> <p>Link to install Story Speaker extension for Story Speaker: https://chrome.google.com/webstore/detail/story-speaker/ohfribhhbknfdkjpdpobnqgkbpj</p>	<p>1) On a business trip to Australia, you take along your American-made compass that you may have used on a camping trip. Does this compass work correctly in Australia? 2) A proton moves with a speed of 1.00×10^5 m/s through Earth's magnetic field, which has a value of 55.0 mT at a particular location. When the proton moves eastward, the magnetic force acting on it is directed straight upward, and when it moves northward, no magnetic force acts on it. (a) What is the direction of the magnetic field, and (b) what is the strength of the magnetic force when the proton moves eastward? (c) Calculate the gravitational force on the proton and compare it with the magnetic force. Compare it also with the electric force if there were an electric field with a magnitude equal to $E = 1.50 \times 10^2$ N/C at that location, a common value at Earth's surface. Note that the mass of the proton is 1.67×10^{-27} kg. 3) A proton moves at 8.00×10^6 m/s along the x-axis. It enters a region in which there is a magnetic field of magnitude 2.50 T, directed at an angle of 60.0° with the x-axis and lying in the xy-plane (Fig. 19.8). (a) Find the initial magnitude and direction of the magnetic force on the proton. (b) Calculate the proton's initial acceleration. 4) Storing charged particles is important for a variety of applications. Suppose a uniform magnetic field exists in a finite region of space. Can a charged particle be injected into this region from the outside and remain trapped in the region by magnetic force alone? 5) A charged particle enters the magnetic field of a mass spectrometer at a speed of 1.79×10^6 m/s. It subsequently moves in a circular orbit with a radius of 16.0 cm in a uniform magnetic field of magnitude 0.350 T having a direction perpendicular to the particle's velocity. Find the particle's mass-to-charge ratio and identify it based on the table below.</p>	<p>Figure 17.9b does the resistance of the diode (a) increase or (b) decrease as the positive voltage DV increases? [graphs as options] 6) All electric devices are required to have identifying plates that specify their electrical characteristics. The plate on a certain steam iron states that the iron carries a current of 6.00 A when connected to a source of 1.20 \times 10² V. What is the resistance of the steam iron? (a) 0.050 Ω (b) 20.0 Ω (c) 36.0 Ω 7) Suppose an electrical wire is replaced with one having every linear dimension doubled (i.e., the length and radius have twice their original values). Does the wire now have (a) more resistance, (b) less resistance, or (c) the same resistance than before? 8) As a charged particle moves freely in a circular path in the presence of a constant magnetic field applied perpendicular to the particle's velocity, the particle's kinetic energy (a) remains constant, (b) increases, or (c) decreases.</p>
	3rd week		UNIT TEST - 1									
	3rd week	Current Electricity	<p>To understand Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel.</p> <p>• To understand Kirchhoff's laws and simple applications. Wheatstone bridge, metre bridge.</p> <p>• To explain Potentiometer - principle and its applications to measure potential difference and for comparing</p> <p>• To understand EMF of two cells; measurement of internal resistance of a cell.</p>	<p>STUDENTS WILL BE ABLE TO understand Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel.</p> <p>• understand Kirchhoff's laws and simple applications. Wheatstone bridge, metre bridge.</p> <p>• explain Potentiometer - principle and its applications to measure potential difference and for comparing</p> <p>• compare EMF of two cells; measure internal resistance of a cell, through research, by solving HOT questions, related numerical and by addressing open ended questions</p>	<p>Group discussion</p> <p>• Experiments</p> <p>• Project</p> <p>• Differentiated Worksheets</p> <p>• Power point presentation</p>	<p>Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.</p>	<p>Competencies: Communication, problem solving digital competence, critical thinking, collaboration, cultural awareness, creativity and innovation, independent learning, leadership and responsibility, self confidence, innovation and self direction, global and environmental awareness</p> <p>Values: Respect, integrity, empathy, resilience, honesty, care, tolerance</p>	<p>Englishspeaking and communication skills, interpreting data mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.</p>				
	4th week	Magnetic Effect of Current and Magnetism	<p>• To explain Concept of magnetic field, Oersted's experiment.</p> <p>• To understand Biot - Savart law and its application to current carrying circular loop.</p> <p>• To understand Ampere's law and its applications to infinitely long straight wire, Straight and toroidal solenoids.</p> <p>• To explain force on a moving charge in uniform magnetic and electric fields.</p> <p>• Cyclotron.</p> <p>• To understand Force on a current-carrying conductor in a uniform magnetic field. Force between two parallel current-carrying conductors-definition of ampere.</p> <p>• To explain Torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.</p>	<p>STUDENTS WILL BE ABLE TO explain Concept of magnetic field, Oersted's experiment.</p> <p>• understand Biot - Savart law and its application to current carrying circular loop.</p> <p>• understand Ampere's law and its applications to infinitely long straight wire, Straight and toroidal solenoids.</p> <p>• explain force on a moving charge in uniform magnetic and electric fields.</p> <p>• Cyclotron.</p> <p>• understand Force on a current-carrying conductor in a uniform magnetic field. Force between two parallel current-carrying conductors-definition of ampere.</p> <p>• explain Torque experienced by a current loop in uniform magnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and voltmeter.</p> <p>through research, by solving HOT questions, related numerical and by addressing open ended questions</p>	<p>Group discussion</p> <p>• Experiments</p> <p>• Project</p> <p>• Differentiated Worksheets</p> <p>• Power point presentation</p>	<p>Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.</p>	<p>Competencies: Communication, problem solving digital competence, critical thinking, collaboration, cultural awareness, creativity and innovation, independent learning, leadership and responsibility, self confidence, innovation and self direction, global and environmental awareness</p> <p>Values: Respect, integrity, empathy, resilience, honesty, care, tolerance</p>	<p>Englishspeaking and communication skills, interpreting data mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.</p>	<p>Make an energy conservation model suitable for U A E</p>			
1st week	Magnetic Effect of Current and Magnetism	<p>To explain Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron.</p> <p>• To understand Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis.</p> <p>• Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid.</p> <p>• To explain magnetic field lines; Earth's magnetic field and magnetic elements.</p> <p>• To explain Para-, dia- and ferro - magnetic substances, with examples.</p> <p>• To understand Electromagnets and factors affecting their strengths. Permanent magnets.</p>	<p>STUDENTS WILL BE ABLE TO explain Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron.</p> <p>• understand Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis.</p> <p>• analyse Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid.</p> <p>• explain magnetic field lines; Earth's magnetic field and magnetic elements.</p> <p>• explain Para-, dia- and ferro - magnetic substances, with examples.</p> <p>• understand Electromagnets and factors affecting their strengths. Permanent magnets.</p> <p>through research, by solving HOT questions, related numerical and by addressing open ended questions</p>	<p>Group discussion</p> <p>• Experiments</p> <p>• Project</p> <p>• Differentiated Worksheets</p> <p>• Power point presentation</p>	<p>Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.</p>	<p>Competencies: Communication, problem solving digital competence, critical thinking, collaboration, cultural awareness, creativity and innovation, independent learning, leadership and responsibility, self confidence, innovation and self direction, global and environmental awareness</p> <p>Values: Respect, integrity, empathy, resilience, honesty, care, tolerance</p>	<p>Englishspeaking and communication skills, interpreting data mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.</p>			<p>1) On a business trip to Australia, you take along your American-made compass that you may have used on a camping trip. Does this compass work correctly in Australia? 2) A proton moves with a speed of 1.00×10^5 m/s through Earth's magnetic field, which has a value of 55.0 mT at a particular location. When the proton moves eastward, the magnetic force acting on it is directed straight upward, and when it moves northward, no magnetic force acts on it. (a) What is the direction of the magnetic field, and (b) what is the strength of the magnetic force when the proton moves eastward? (c) Calculate the gravitational force on the proton and compare it with the magnetic force. Compare it also with the electric force if there were an electric field with a magnitude equal to $E = 1.50 \times 10^2$ N/C at that location, a common value at Earth's surface. Note that the mass of the proton is 1.67×10^{-27} kg. 3) A proton moves at 8.00×10^6 m/s along the x-axis. It enters a region in which there is a magnetic field of magnitude 2.50 T, directed at an angle of 60.0° with the x-axis and lying in the xy-plane (Fig. 19.8). (a) Find the initial magnitude and direction of the magnetic force on the proton. (b) Calculate the proton's initial acceleration. 4) Storing charged particles is important for a variety of applications. Suppose a uniform magnetic field exists in a finite region of space. Can a charged particle be injected into this region from the outside and remain trapped in the region by magnetic force alone? 5) A charged particle enters the magnetic field of a mass spectrometer at a speed of 1.79×10^6 m/s. It subsequently moves in a circular orbit with a radius of 16.0 cm in a uniform magnetic field of magnitude 0.350 T having a direction perpendicular to the particle's velocity. Find the particle's mass-to-charge ratio and identify it based on the table below.</p>		
2nd week	Electromagnetic Induction and Alternating Current	<p>• To explain Electromagnetic induction;</p> <p>• To understand Faraday's laws, induced EMF and current; Lenz's Law.</p>	<p>STUDENTS WILL BE ABLE TO explain Electromagnetic induction;</p> <p>• understand and analyse Faraday's laws, induced EMF and current; Lenz's Law.</p> <p>through research, by solving HOT questions, related numerical and by addressing open ended questions</p>	<p>Group discussion</p> <p>• Experiments</p> <p>• Project</p> <p>• Differentiated Worksheets</p> <p>• Power point presentation</p>	<p>Smart board, Ncert book, related videos, ppt, sticky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.</p>	<p>Competencies: Communication, problem solving digital competence, critical thinking, collaboration, cultural awareness, creativity and innovation, independent learning, leadership and responsibility, self confidence, innovation and self direction, global and environmental awareness</p> <p>Values: Respect, integrity, empathy, resilience, honesty, care, tolerance</p>	<p>Englishspeaking and communication skills, interpreting data mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs.</p>	<p>Search Google map in energy sources UAE Rule Based AI app. students to go to https://maps.google.com and enter a specific source and destination.</p>		<p>1) Argentina has more land area (2.8×10^6 km²) than Greenland (2.2×10^6 km²). Why is the magnetic flux of Earth's magnetic field larger through Greenland than through Argentina? 2) A conducting circular loop of radius 0.250 m is placed in the xy-plane in a uniform magnetic field of 0.360 T that points in the positive z-direction, the same direction as the normal to the plane. (a) Calculate the magnetic flux through the loop. (b) Suppose the loop is rotated clockwise around the x-axis, so the normal direction now points at a 45.0° angle with respect to the z-axis. Recalculate the magnetic flux through the loop. (c) What is the change in flux due to the rotation of the loop? 3) An airplane with a wingspan of 30.0 m flies due north at a location where the downward component of Earth's magnetic field is 0.600 \times 10² T. There is also a component pointing due north that has a magnitude of 0.470 \times 10² T. (a) Find the difference in potential between the wingtips when the speed of the plane is 2.50 \times 10² m/s. (b) Which wingtip is positive? 4) In what directions are magnetic forces exerted on electrons in the metal aircraft if it is</p>		

October	2nd week	Optics	To explain Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.	STUDENTS WILL BE ABLE TO pupil can explain Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers. through teachers guidance ,support materials and reinforcement sessions.	The Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, sticky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance	List the applications of spherical mirrors by identifying the places it used in U A E	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies.....			
	3rd week	Optics	To analyze Wave front and Huygen's principle, • To explain reflection and refraction of plane wave at a planesurface using wave fronts. • To understand Proof of laws of reflection and refraction using Huygen's principle.	STUDENTS WILL BE ABLE TO analyze Wave front and Huygen's principle, • explain reflection and refraction of plane wave at a planesurface using wave fronts. • understand and explain Proof of laws of reflection and refraction using Huygen's principle. through research,by solving HOT questions, related numerical and by addressing open ended questions	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, sticky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance	List the applications of spherical mirrors by identifying the places it used in U A E	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies.....	Discuss about the support of U A E government for all residents through their well planned energy distribution system. Link to install Story Speaker extension for Story Speaker: https://chrome.google.com/webstore/detail/speaker/ohfibfhfbkfnkkipjopbneqkbbkjpj	1) An observer on the west-facing beach of a large lake is watching the beginning of a sunset. The water is very smooth except for some areas with small ripples. The observer notices that some areas of the water are blue and some are pink. Why does the water appear to be different colors in different areas? 2) When standing outside in the Sun close to a single-pane window looking to the darker interior of a building, why can you often see two images of yourself, one superposed on the other? 3) A light ray of wavelength 589 nm (produced by a sodium lamp) traveling through air is incident on a smooth, flat slab of crown glass at an angle u1 of 30.0° to the normal, as sketched in Figure 22.11. (a) Find the angle of refraction, u2. (b) At what angle u3 does the ray leave the glass as it re-enters the air? (c) How does the answer for u3 change if the ray enters water below the slab instead of the air? 4) Light of wavelength 589 nm in vacuum passes through a piece of fused quartz of index of refraction n = 1.458. (a) Find the speed of light in fused quartz. (b) What is the wavelength of this light in fused quartz? (c) What is the frequency of the light in fused quartz? 5) When a beam of light enters a glass prism, which has nonparallel sides, the rainbow of color exiting the prism is a testimonial to the dispersion occurring in the glass. Suppose a beam of light enters a slab of material with parallel sides. When the beam exits the other side, traveling in the same direction as the original beam, is there any evidence of dispersion? 6) A beam of light is incident on a prism of a certain glass at an angle of u1 = 30.0°, as shown in Figure 22.18. If the index of refraction of the glass for violet light is 1.80, find (a) u2, the angle of refraction at the air-glass interface, (b) u3, the angle of incidence at the glass-air interface, and (c) u4, the angle of refraction when the violet light exits the prism. (d) What is the value of D, the amount by which the violet light is displaced vertically? 7) On passing through the prism, will yellow light bend through a larger angle or smaller angle than the violet light? (a) Yellow light bends through a larger angle. (b) Yellow light bends through a smaller angle. (c) The angles are the same.	
	4th week	Optics	To understand Interference, Young's double slit experiment and expression for fringe width, • To explain coherent sources and sustained interference of light.	STUDENTS WILL BE ABLE TO understand Interference, Young's double slit experiment and expression for fringe width, • To explain coherent sources and sustained interference of light. through research,by solving HOT questions, related numerical and by addressing open ended questions	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, sticky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance	List innovative ideas for the use of spherical mirrors, by identifying the places where it can be used in U A E.	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies.....			
November	IST WEEK		UNIT TEST - 2 [REVISION]									
November	1st week	Optics	To understand Diffraction due to a single slit, width of central maximum. • To understand Resolving power of microscopes and astronomical telescope. • To analyze Polarisation, plane polarised light, Brewster's law, uses of plane polarised light and Polaroid	STUDENTS WILL BE ABLE TO understand Diffraction due to a single slit, width of central maximum. • To understand Resolving power of microscopes and astronomical telescope. • To analyze Polarisation, plane polarised light and Polaroid through research,by solving HOT questions, related numerical and by addressing open ended questions	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, sticky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance		Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies.....history based on astronomical bodies.	A description about contribution of astronomers in the field of astrophysics and about communication satellites. Link to install Story Speaker extension for Story Speaker: https://chrome.google.com/webstore/detail/speaker/ohfibfhfbkfnkkipjopbneqkbbkjpj 3D representation of space using AI go to https://autodraw.com .		
	2nd week	Dual Nature of Matter	• To analyze Dual nature of radiation. Photoelectric effect, • To understand Hertz and Lenard's observations; • To analyze Einstein's photoelectric equation-particle nature of light.	STUDENTS WILL BE ABLE TO analyze Dual nature of radiation. Photoelectric effect, • understand and analyse Hertz and Lenard's observations; • analyze Einstein's photoelectric equation-particle nature of light. through research,by solving HOT questions, related numerical and by addressing open ended questions	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, sticky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance	Explain any one optical phenomenon that you observed while you are in U A E	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies.....history based on astronomical bodies.	1) A polarizer for microwaves can be made as a grid of parallel metal wires about 1 cm apart. Is the electric field vector for microwaves transmitted through this polarizer parallel or perpendicular to the metal wires? 2) Unpolarized light is incident upon three polarizers. The first polarizer has a vertical transmission axis, the second has a transmission axis rotated 30.0° with respect to the first, and the third has a transmission axis rotated 75.0° relative to the first. If the initial light intensity of the beam is I0, calculate the light intensity after the beam passes through (a) the second polarizer and (b) the third polarizer.	1) Does a diffraction grating with more lines have a smaller or larger separation between adjacent principal maxima? 2) At what angle relative to the previous polarizer must an additional polarizer be placed so as to completely block the light? 3) plane monochromatic light wave is incident on a double - slit as illustrated in Figure 24.4. As the slit separation decreases, what happens to the separation between the interference fringes on the screen? (a) It decreases. (b) It increases. (c) It remains the same. (d) It may increase or decrease, depending on the wavelength of the light. (e) More information is required.	
	3rd week	Atoms and Nuclei	• To understand Alpha-particle scattering experiment; • Rutherford's model of atom; • To understand Bohr model, energy levels, • To explain hydrogen spectrum. • Composition and size of nucleus, To understand Radioactivity, alpha, beta and gamma particles/rays and their properties; • radioactive decay law. • To understand Mass-energy relation, mass defect; • To analyze binding energy per	STUDENTS WILL BE ABLE TO understand and analyse Alpha-particle scattering experiment; • Explain Rutherford's model of atom; • understand and explain Bohr model, energy levels, • explain hydrogen spectrum. • Composition and size of nucleus, through research,by solving HOT questions, related numerical and by addressing open ended questions understand and explain Radioactivity, alpha, beta and gamma particles/rays and their	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, sticky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competence,critical thinking,collaboration, cultural awareness,creativity and innovation,independent learning,leadership and responsibility,self confidence,innovation and self direction,global and environmental awareness Values: Respect,integrity,empathy,resilience ,honesty,care,tolerance	Study and suggest places where you find the necessity of traffic signals in U A E	Englishspeaking and communication skills, interpreting datas mathematics.....pythagorus theorem, parallax method, integration and differentiation, trigonometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies.....historic buildings in UAE			

