P						NAME OF THE DE	PARTMENT -SCIENCE	SYLLABU	US BREAK UP 2021-22 -AJI				
Name of the	Subject Teach	ner:- LEKSHMI CHAND	RAN			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 VISTUAL LEARNING	Teaching Aids / Reference/ Resources	Competencies and Values	MY IDENTITY	Cross curricular link	Artificial Intelligence	Critical Thinking Questions- Descriptive	Critical Thinking Questions- Objective
	1st week	Electrostatics		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.	students will be able to 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. 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, stcky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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	Identify different electric power plants in U A E	Englishspeaking and communication skills, interpreting datas Social studieslife story of scientists. mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric 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-	m, and the positive charge q 2 5 6.0 mC 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?	negative charge. (c) It has a positive charge. (d) It may be either charged or uncharged. 2) Object A has a charge of 12 mC, and object B has a charge of 16 mC. Which statement is true? [OPTIONS] 3) A test charge of 13 mC is at a point P where the electric field due to other charges is directed to the right and has a magnitude of 4 3 106 N/C. If the test charge is replaced with a charge of 23 mC, the electric field at P (a) has the same magnitude as before, but changes direction, (b) increases in emagnitude and changes direction, (c) remains the same, or (d) decreases in magnitude and changes direction, (d) cricular 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 Tree* electron and a 'free* proton are placed in an identical electric field. Which
	2nd week	Electrostatics		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).	STUDENTS WILL BE ABLE TO 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	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, stcky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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	Identify different electric power distribution companies in U A E	Englishspeaking and communication skills, interpreting datas Social studieslife story of scientists. mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm	speaker/ohfibfhhfbiknfdkipjdopbnegkbkjpj Introduction to Story Speaker: https://www.youtube.com/watch?v=wsrzvY YvhH8&feature=youtube		
APRIL	3rd week	Electrostatics	24	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.	STUDENTS WILL BE ABLE TO 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. 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, steky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric 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.		
	4th week	Electrostatics		To understand Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, • To explain capacitors and capacitance, combination of 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	STUDENTS WILL BE ABLE TO 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 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	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Neert book, related videos, ppt, steky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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	How will you coserve electricity and how is it important for the future of U A E	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric 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.		
	1st week	Current Electricity		To understand Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and theirrelation with electric current;	Explain drift velocity, mobility and theirrelation with electric current; through research,by solving HOT questions, related	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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	What suggestions do you have to enhance the efficient utilisation of electrial energy in U A E.	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric 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 s² What is the average power? 2) copper wire of cross - sectional area 3.00 3 1026 m2 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 lectrons 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/cm3, and its atomic mass is 63.5 u. 3) As a lightbulb ages, why does it gives 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	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. (Ia is the current in Figure 17.2a, 1b the current in Figure 17.2b, etc.) (a) Id, Ia, Ic, Ib, (b) Ia, Ic, Ib, Id (c) Ic, Ia, Id, Ib, Ib, Ib, Ic, Ia (e) Ia, Ib, Ic, Ib, Id (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. (b) It speeds up as the cross section seconds smaller. (c) It doesn't change. (d) More information is needed. 4) Look at the four 'circuits' shown in Finure 17 6 and select those that will light the hulb Icircuit

	2nd week	Current Electricity		To understand Ohm's law, electrical resistance, V-I characteristics (linear and nonlinear), electrical energy and power, electrical resistivity and conductivity. - To explain Carbon resistors, colourcode for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance.	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. • explain Carbon resistors, colourcode for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance. 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, stcky notes , blank papers, differentiated worksheets, assessment tasks etc. PHET simulations.	Competencies: Communication, problem solving digital competance, 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	Give examples of alternative sources of energy that are suitable	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.	Talk about the different alternative sources of energy suitable for the supply of electric current Link to install Story Speaker extension for Story Speaker.		diagrams as options] 5) In 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 3 102 V. What is the resistance of the steam iron? (a) 0.050 0 V (b) 20.0 V (c) 36.0 V 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.
	3rd week				UNIT TEST - 1				for U A E		https://chrome.google.com/webstore/detail/	S	
May	3rd week	Current Electricity	24	To understand Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series andin parallel. • To understand Kirchhoff's laws and simple applications. Wheatstone bridge, metre bridge. • To explain Potentiometer - principle and its applications to measure potential difference and for comparing • To understand EMF of two cells; measurement of internal resistance of a cell.	STUDENTS WILL BE ABLE TO understand Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series andin parallel. understand Kirchhoff's laws and simple applications. Wheatstone bridge, metre bridge. explain Potentiometer - principle and its applications to measure potential difference and for comparing 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	Power point presentation	Smart board, Ncert book, related videos, ppt, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.	tory- speaker/ohfibfhhfbhknfdkipjdopbnegkbkjpj		
	4th week	Magnetic Effect of Current and Magnetism		To explain Concept of magnetic field, Oersted's experiment. To understand Biot - Savart law and its application to current carrying circular loop. To understand Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids, To explain force on a moving charge in uniform magnetic and electric fields. Cyclotron. To understand Force on a current-carrying conductor in a uniform magnetic field. Force between two parallelcurrent-carrying conductors-definition of ampere. To explain Torque experienced by a current loop in uniformmagnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter and volumeter.	STUDENTS WILL BE ABLE TO explain Concept of magnetic field, Oersted's experiment. understand Biot - Savart law and its application to current carrying circular loop. understand Ampere's law and its applications to infinitely long straight wire. Straight and toroidal solenoids, explain force on a moving charge in uniform magnetic and electric fields. Cyclotron. understand Force on a current-carrying conductor in a uniform magnetic field. Force between two parallelcurrent-carrying conductors-definition of ampere. explain Torque experienced by a current loop in uniformmagnetic field; moving coil galvanometer-its current sensitivity and conversion to ammeter andvoltmeter. through research, by solving HOT questions, related numerical and by addressing open ended questions	Group discussion • Experiments • Project • Differentiated Worksheets	Smart board, Ncert book, related videos, ppt, steky notes, blank papers, differentiated worksheets, assessment tasks etc. PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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	Make a energy conservation model suitable for U A E	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.			
	1st week	Magnetic Effect of Current and Magnetism		To explain Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of arevolving electron. • To understand Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis andperpendicular to its axis. • Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, • To explain magnetic field and magnetic elements. • To explain para-, dia- and ferro - magnetic substances, with examples. • To understand Electromagnets and factors affecting their strengths. Permanent magnets.	and its magnetic dipole moment .Magnetic dipole moment of arevolving electron. • understand Magnetic fleid intensity due to a magnetic dipole (bar magnet) along its axis andperpendicular to its axis. • analyse Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, • explain magnetic field lines; Earth's magnetic field and magnetic elements. • explain Para-, dia- and ferro - magnetic substances, with examples. • understand Electromagnets and factors affecting their strengths. Permanent magnets. through research, by solving HOT	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, stcky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.		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 a 105 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 feld, 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 field. Grec. Compare it also with the electric force if there were an electric field with a magnitude equal to E 5 1.50 3 102 N/C at that location, a common value at Earth's surface. Note that the mass of the proton is 1.67 3 10227 kg. 3) A proton moves at 8.00 3 106 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 x - 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. 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 3 106 m/s. It subsequently moves in a circular orbit with a radius of 16.0 cm in a uniform magnetic field of magnitude of 16.0 cm in a uniform magnetic field of magnitude of 16.0 cm in a uniform magnetic field of magnitude particle by the proton is a proton of pagnetic form the region by magnetic field of magnitude of 16.0 cm in a uniform magnetic field of magnitude of 16.0 cm in a uniform happed in the region of identify it the particle by	1) A charged particle moves in a straight line through a region of space. Which of the following answers must be true? (Assume any other fields are negligible.) The magnetic field (a) has a magnitude of zero (b) has a zero component perpendicular to the particle's velocity (c) has a zero component parallel to the particle's velocity (c) has a zero component parallel to the particle's velocity (c) has a stationary positively charged piece of plastic. Is the plastic (a) attracted, (b) repelled, or (c) unaffected by the magnet? 3) 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. 4) A square and a circular loop with the same area lie in the xy - plane, where there is a uniform magnetic field B pointing at some angle u with respect to the positive z - direction. Each loop carries the same current, in the same direction. Which magnetic torque is larger? (a) the torque on the siquare loop (b) the torque on the circular loop (c) the torques are the same (d) more information is needed
	2nd week	Electromagnetic Induction and Alternating Current		To explain Electromagnetic induction; To understand Faraday's laws, induced EMF and current; Lenz's Law,	STUDENTS WILL BE ABLE TO • explain Electromagnetic induction; • understand and analyse Faraday's laws, induced EMF and current; Lenz's Law, 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, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trigomoteric ratios, binomial theorem, logarithm, analyzing graphs.	Search Google map in energy sources UAE Rule Based Al app. students to go to https://maps.google.com and enter a specific source and destination.	1) Argentina has more land area (2.8 3 106 km2) than Greenland (2.2 3 106 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 the ein 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 pointing due north that has a magnitude of 0.470 3 1024 T. (a) Flind the difference in potential between the wingtips when the speed of the plane is 2.50 3 the rotations are	

June	3rd week		24		PERIODIC ASSESSMENT - 1	[REVISION]]			flying due west? (a) north (b) south (c) east (d) west (e) up (f) down 5) (a) The sliding bar in Figure 20.16a has a length of 0.500 m and moves at 2.00 m/s in a magnetic field of magnitude 0.250	zero (c) counterclockwise (d) along the length of the magnet 4) Two circular loops are side by side and lie in the xy - plane. A switch is closed, starting a counterclockwise current in the left-hand loop, as viewed from a	
	3rd week	Electromagnetic Induction and Alternating Current		To explain Eddy currents.Self and mutual induction. • To explain Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; • To understand LC oscillations (qualitative treatment only), LCR series circuit, resonance;	STUDENTS WILL BE ABLE TO explain Eddy currents.Self and mutual induction. explain Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; understand and analyse LC oscillations (qualitative treatment only), LCR series circuit, resonance; 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, stcky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies:Communication, problem solving digital competance,critical thinkng,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	Site a recent step took by UA E government to benefit the residents which involve the use of magnetic field	Englishspeaking and communication skills, interpreting datas mathematiespythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.		T. Using the concept of motional emf, find the induced voltage in the moving rod. (b) if the resistance in the circuit is 0.500 V, find the current in the circuit and the power delivered to the resistor. (Note : Cladulate the magnetic force on the bar. (d) Use the concepts of work and power to calculate the applied force. 6) An AC generator consists of eight turns of wire, each having area A 5 0.090 0 m2, with a total resistance of 12.0 V. The coil rotates in a magnetic field of 0.500 T at a constant frequency of 60.0 Hz, with axis of rotation perpendicular to the direction of the magnetic field. (a) Find the maximum induced emf. (b) What is the maximum induced current? (c) Determine the induced emf and current as functions of time. (d) What maximum torque must be applied to keep the coil turning? 7) An AC generator is to have a maximum output of 301 V. Each circular turn of wire has an area of 0.100 m2 and a resistance of 0.80 V. The coil rotates in a magnetic field of 0.600 T with a frequency of 40.0 Hz, with the axis of rotation perpendicular to the direction of the magnetic field. (a) How many turns of wire should the coil have to produce the desired emf? (b) Find the maximum current induced in the coil. (c) Determine the induced emf as a function of time. 8)The switch in the circuit shown in Figure 20.29 is closed, and the lightbulb (gos steadily. The inductor is a simple air-core solenoid. An iron rod is inserted into the lightbulb (a) increases, (b) decreases, or (c) remains the same.	loop. Which of the following statements is true of the right-hand loop? (a) The current remains zero. (b) An induced current moves counterclockwise. (c) An induced current moves clockwise. For any control of the cont	
	4th week	Electromagnetic Induction and Alternating Current		To understand power in AC circuits, wattless current. AC generator and transformer.	STUDENTS WILL BE ABLE TO understand and analyse power in AC circuits, wattless current. Explain the working of AC generator and transformer, 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, stcky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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	Identify various modes of transportation in U A E	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.				
July August							SUMMER VACATION							
	1st week	Electromagnetic Waves	6	To understand Need for displacement current, To explain Electromagnetic waves and their characteristics (qualitative ideas only). To understand Transverse nature of electromagnetic waves. To explain Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gammarays) including elementary facts about their uses.	STUDENTS WILL BE ABLE TO understand and explain Need for displacement current, explain Electromagnetic waves and their characteristics (qualitative ideas only). understand and analyse Transverse nature of electromagnetic waves. explain Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gammarays) including elementary facts about their uses. 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, stcky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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	Which hositals in U A E has MRI scanning.	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.	use google map to search how UAE hospitals effectively use the MRI scanning system to rule out diseases.	1) An AC voltage source has an output of Dv 5 (2.00 3 10 2 V) sin 2pft. This source is connected to a 1.00 3 102 V resistor as in Figure 21.1. Find the rms voltage and rms current in the resistor. 2)An 8.00 - mF capacitor is connected to the terminals of an AC generator with an rms voltage of 1.50 3 10 2 V and a frequency of 80.0 Hz. Find the capacitive reactance and the rms current in the circuit. 3) In a purely inductive AC circuit (see Fig. 21.6), L 5 25.0 mH and the rms voltage is 1.50 3 102 V. Find the inductive reactance and ms current in the circuit if the frequency is 60.0 Hz. 4) A series RLC AC circuit has resistance R 5 2.50 at 3 102 V, inductance L 5 0.600 H, capacitance C 5 3.50 mF, frequency 15 60.0 Hz, and maximum voltage DVmax 5 1.50 3 102 V. Find (a) the impedance of the circuit, (b) the maximum current in the circuit, (c) the phase angle, and (d) the maximum Voltages across the elements.	1) Which of the following statements can be true for a resistor connected in a simple series circuit to an operating AC generator? [OPTIONS] 2) True or False: The larger the capacitiance of a capacitor, the larger the capacitive reactance. 3) For the circuit in Figure 21.8, is the instantaneous voltage of the source equal to (a) the sum of the maximum voltages across the elements, (b) the sum of the instantaneous voltages across the elements, or (c) the sum of the rms voltages across the elements? 4) If switch A is closed in Figure 21.12, what happens to the impedance of the circuit? (a) It increases. (b) It decreases. (c) It doesn't change. 5) True or False: In an RLC circuit, the impedance must always be greater than or equal to the resistance. 6) Analyze a series RLC AC circuit for which R 5 175 V, L 5 0.500 H, C 5 2.25 mF, 15 600 Hz, and DVmax 5 325 V. Find (a) the impedance, (b) the maximum current, (c) the phase angle, and (d) the maximum voltages across the elements.	
September	2nd week				HALF YEARLY EXAM	•								
	3rd week 4th week	Optics	6	To analyze Reflection of light, spherical mirrors, mirror formula To understand Refraction of light, total internal reflectionand its applications, optical fibres, To analyze refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula. Magnification, power of a lens,	STUDENTS WILL BE ABLE TO analyze Reflection of light, spherical mirrors, mirror formula. understand and analyse Refraction of light, total internal reflectionand its applications, explain the working of optical fibres, analyze refraction at spherical surfaces, lenses, thin lens formula, explain lensmaker's formula. Magnification, power of a lens, 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, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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	ė.	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs.	A description about the maintanence of energy resources in UAE Artificial Intelligence Integrated History and AI (Data Acquisition & Data Exploration) In this activity, students will be collecting data around various parameters which will help them in exploring history in a better way. They will think of areas which interest them the most and search online for various sources of data. They then need to select reliable sources of data and seek authentic information of out them. After acquiring data there comes the need to			
	1st week	Optics		To understand combination of thin lenses, combination of a lens and a mirror • To explain .Refraction and dispersion of light through a prism. • To analyze Scattering of light blue colour of sky and reddish apprearance of the sun at sunrise and sunset.	sunrise and sunset.	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studiesergy sources maping	Communicate the same to others effectively.			

	2nd week	2nd week Optics		To explain Microscopes and astronomical telescopes (reflecting and refracting) andtheir magnifying powers.	STUDENTS WILL BE ABLE TO pupil can explain Microscopes and astronomical telescopes (reflecting and refracting) andtheir magnifying powers. trhough teachers guidance ,support materials and reinforcement sessions.	Group discussion • Experiments • Project • Differentiated Worksheets • Power point presentation	Smart board, Ncert book, related videos, ppt, steky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies			
October	3rd week	Optics	Optics 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, e 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, Neert book, related videos, ppt, steky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies	Discuss about the support of UAE government for all residants through their well planned energy distribution system. Link to install Story Speaker extension for Story Speaker:	 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? 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? Ighit ray of wavelength S89 nm (produced by a sodium lamp) traveling through air is incident on a smooth, flat slab of crown glass at an angle ut of 30.0° to the normal, as sketched in Figure 22.11. Find the angle of refraction, u. 2. (b) At what angle u.3 does the ray leave the glass as it re-enters the air? (c) How does the answer for u.3 change if the ray enters water below the slab instead of the air? Light of wavelength S89 nm in vacuum passes through a piece of fused quartz (r) (b) What is the wavelength of this light in fused quartz? (c) What is the wavelength of this light in fused quartz? (c) What is the wavelength of this light in fused quartz? (c) What is the trequency of the light in fused quart in the spend of light in fused quartz. (b) What is the wavelength of this light in fused quarts? Symen 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? A beam of light enters a slab of material with parallel sides. When the beam exits the other side, treveling in the same direction as the original beam, is there any evidence of dispersion? A beam of light in fused quarts of the plass of the plass of the plass of the p	1) Which part of Figure 22.3, (a) or (b), better shows specular reflection of light from the roadway? 2) Two mirrors make an angle of 120° with each other, as in Figure 22.5. A ray is incident on mirror M1 at an angle of 65° to the normal. Find the angle the ray makes with the normal to M2 after it is reflected from both mirrors. 3) If beam 1 is the incoming beam in Figure 22.6b, which of the other four beams are due to reflection? Which are due to refraction? 4) A material has an index of refraction that increases continuously from top to bottom. Of the three paths shown in Figure 22.10, which path will a light ray follow as it passes through the material? 5) As light travels from a vacuum (n 5 1) to a medium such as glass (n . 1), which of the following properties remains the same: the (a) wavelength, (b) wave speed, or (c) frequency? 6) Suppose the plastic were replaced by a material with a higher index of refraction. How would the width of the beam at the information layer be affected? (a) It would remain the same. (b) It would decrease. (c) It would increase. 7) (a) Find the critical angle for a water-air boundary. (b) Use the result of part (a) to precit what a fish will see (Fig. 22.28) if it looks up toward the water surface at angles of 40.0°, 48.6°, and 60.0°. 8) In a two -siti interference pattern projected on a screen, are the fringse eagles, or (c) only for small angles? 9) If the distance between the sits is doubled. (b) The width is doubled. (b) The width is unchanged. (c) The width is clubbled. (b) The width is unchanged. (c) The width is abubbled. (b) The width is unchanged. (c) The width is abubble. (b) Breen, led (c) blue, green, led
	4th week	Optics		To understand Interference, Young's double slit experiment and expression for fringe width, • To explain coherent sources andsustained 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, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studies			
November	IST WEEK				UNIT TEST - 2 [REVIS	SION]							
	1st week	Optics		of microscopes and astronomical telescope.	STUDENTS WILL BE ABLE TO understand Diffraction due to a single slit, width of central maximum. • To understand Resolvingpower of microscopes and astronomical telescope. • To analyze Polarisation, plane polarised light, Brewster'slaw, uses of 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, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studieshistory 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/story-speaker/ohfibfhhfbhknfdkipjdopbnegkbkjpj 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, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studieshistory based on astronomical bodies.		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? 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 30.0° with respect to the first. If the initial light intensity of the beam is lb, 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.
November	3rd week	Atoms and Nuclei	24	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, stcky notes , blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, critical thinkng, 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 mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studieshistoric buildings in UAE			

	4th week	Electronic Devices		To analyze Energy bands in solids (Qualitative ideas only) To understand conductor, insulator and semiconductor; To analyze semiconductor diode - I-V characteristics in forward and reverse bias, diode as a rectifier; To analyze I-V characteristics of LED, To explain photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator.		Group discussion - Experiments - Project - Differentiated Worksheets - Power point presentation	Smart board, Ncert book, related videos, ppt, stcky notes, blank papers, differentiated worksheets, assessment tasks etc, PHET simulations.	Competencies: Communication, problem solving digital competance, 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 advantageous and disadvatageous of round abouts in Al Ain in comparison with traffic signals.	Englishspeaking and communication skills, interpreting datas mathematicspythagorus theorem, parallax mathod, integration and differentiation, trignometric ratios, binomial theorem, logarithm, analyzing graphs. Social studieshistoric buildings in UAE	To construct a building usind 3D autodraw go to https://autodraw.com. Explain various measurements that can be taken to protect the buuilding from external calamities. Link to install Story Speaker extension for Story Speaker: https://chrome.google.com/webstore/detail/story-speaker/ohfibfhhfbhknfdkipjdopbnegkbkjpj		
December	IST WEEK									<u>'</u>			
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December	2nd week												
							WINTER VACATION						
	1st week						mock p	ractical					
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	3rd week												
	4th week 1st week						ANNUAL EXAMINATION ANNUAL	L EXAMINATION					
	2nd week												
February	3rd week	revision	18				ANNUAI	L EXAMINATION					
	4th week	revision											
March	1st week 2nd week 3rd week	revision	6				ANNUAL EXAMINATION 2020-21						
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