Subject Code : 613 Section Code : -Select- Difficulty: 1

Subject Code	Q Id	Questions	Answer Key
613	151	If A is the amplitude of oscillation, the distance moved by the particle in simple harmonic motion in one time period is (A) A (B) 2A (C) zero (D) 4A	(D)
613	152	Two bodies of mass m and 4 m are moving with equal linear momentum. The ratio of their kinetic energy is (A) 4 : 1 (B) 1 : 4 (C) 1 : 2 (D) 1 : 1	(B)
613	153	A particle executes simple harmonic motion represented by y = 0.02 sin 100t. The amplitude and frequency of motion are (A) 0.02 m and 100 Hz (B) 0.01 m and 50 Hz (C) 0.02 m and (50/π)Hz (D) 0.02 m and (100/π) Hz	(C)
613	154	A man is standing in a lift falling freely under gravity and releases a ball from his hand. As seen by him, the ball (A) falls down (B) remains stationary (C) goes up (D) executes simple harmonic motion	(B)
613	155	When the source and the listener move in the same direction with a speed equal to the half of the speed of sound, the change in frequency of the sound is (A) zero (B) 0.25 (C) 0.5 (D) 0.75	(A)
613	156	An oil drop falling freely under the influence of gravity alone experiences a resistive force proportional to its (A) mass (B) charge (C) speed (D) size	(C)
613	157	The change in frequency due to Doppler effect does not depend on (A) the speed of the source (B) the speed of the observer	(D)

		(C) the frequency of the source (D) the separation between the source and the observer	
613	158	Which one of the following properties show that light is a transverse wave? (A) Interference (B) Reflection (C) Polarization (D) Diffraction	(C)
613	159	The wave fronts of light coming from a distant source of unknown shape are nearly (A) plane (B) elliptical (C) spherical (D) cylindrical	(A)
613	160	Two sources are said to be coherent if they produce waves (A) of equal wavelength (B) of equal velocity (C) having same shape of wave front (D) having a constant phase difference	(D)
613	161	Total internal reflection can take place only if (A) light goes from optically rarer medium to optically denser medium (B) light goes from optically denser medium to rarer medium (C) the refractive indices of the two media are close to each other (D) the refractive indices of the two media are widely different	(B)
613	162	The dimensions of linear momentum is (A) MLT–1 (B) ML2T–1 (C) MLT–2 (D) ML–1T–1	(A)
613	163	Viscosity is a property of (A) liquids only (B) solids only (C) liquids and solids (D) liquids and gases	(D)
613	164	For a gas, the root mean square velocity of molecules at 800 K is (A) four times the value at 200 K (B) two times the value at 200 K (C) half the value at 800 K (D) same as at 200 K	(B)

613	165	The Van der Waals equation of state for a real gas is (A) $\left(P+\frac{a}{V^2}\right)(V-b)=RT$ (B) $PV=RT$ (C) $\left(P-\frac{a}{V^2}\right)(V+b)=RT$ (D) $\left(P-\frac{a}{V^2}\right)(V-b)=RT$	(A)
613	166	The efficiency of Carnot engine working between 127oC and 27oC is (A) 1 (B) 0.5 (C) 0.25 (D) 0.75	(C)
613	167	In a reversible process, the entropy of the system (A) increases (B) remains constant (C) is zero (D) decreases	(B)
613	168	The particles obeying Maxwell-Boltzmann statistics are (A) identical and indistinguishable (B) identical but distinguishable (C) photons (D) fermions	(B)
613	169	The spin of the photon is (A) zero (B) $\frac{1}{2}\hbar$ (C) $1\,\hbar$ (D) $\frac{3}{2}\hbar$	(C)
613	170	Pitch of a sound refers to (A) amplitude (B) phase (C) frequency (D) loudness	(C)
613	171	Resolving power of a telescope is	(B)

		(A) directly proportional to the wavelength of the light used (B) inversely proportional to wavelength of the light used (C) inversely proportional to diameter of the objective (D) inversely proportional to square of the wavelength of light used	
613	172	In Rayleigh scattering of light, the intensity of the scattered light is proportional to (A) 1/ λ4 (B) 1/ λ2 (C) λ2 (D) λ3	(A)
613	173	In a doubly refracting crystal, the axis along which the extraordinary ray (E-ray) and ordinary ray (O-ray) have equal velocities is called (A) polarising axis (B) principal axis (C) non-polarizing axis (D) optic axis	(D)
613	174	The postulates of special theory of relativity are applicable only to (A) stationary frame of reference (B) inertial frame of reference (C) non-inertial frame of reference (D) accelerated frame of reference	(B)
613	175	Heisenberg's Uncertainty principle is not applicable to the following pairs of physical variables (A) position and linear momentum (B) energy and time (C) force and acceleration (D) angular displacement and angular momentum	(C)
613	176	Two wave functions $\psi_1(x)$ and $\psi_2(x)$ are said to be orthogonal if (A) $\int \psi_1^*(x)\psi_2(x)dx = 1$ (B) $\int \psi_1^*(x)\psi_2(x)dx = 0$ (C) $\int \psi_1^*(x)\psi_2(x)dx \neq$ (D) $\int \psi_1(x)\psi_2(x)dx = 0$	(B)
613	177	The energy of a one dimensional harmonic oscillator in the ground state is	(B)

		(A) 0 (B) $\frac{1}{2}h\nu$ (C) $\frac{3}{2}h\nu$ (D) $h\nu$	
613	178	The maximum value allowed for orbital quantum number for a given principle quantum number n is (A) n (B) n–1 (C) n–2 (D) n+1	(B)
613	179	In normal Zeeman effect, the spectral line of an atom in a magnetic field is split into (A) 2 component lines (B) 3 component lines (C) 4 component lines (D) more than 4 component lines	(B)
613	180	The yellow D-lines of sodium spectrum correspond to (A) sharp series (B) diffuse series (C) principal series (D) fundamental series	(C)
613	181	On increasing the number of electrons striking the anode of an X-ray tube, which of the following characteristics of X-rays increase? (A) Frequency (B) Wavelength (C) Intensity (D) Quality	(C)
613	182	In an X-ray tube, the quality (penetrating power) of X-rays produced is determined by (A) magnitude of the filament current (B) magnitude of the filament voltage (C) size of the cathode (D) potential difference between the cathode and the anode	(D)
613	183	Which one of the following molecules does not possess a permanent electric dipole moment? (A) H2 (B) NO (C) HCl (D) CO	(A)

613	184	In which of the following bonding type, bonding is formed by the transfer of electrons from one atom to another (A) ionic bonding (B) covalent bonding (C) Van der Waals bonding (D) metallic bonding	(A)
613	185	Susceptibility of a diamagnetic material is (A) zero (B) very large (C) small and negative (D) small and positive	(C)
613	186	Fermi level is defined as (A) lowest filled level at 0 K (B) lowest filled level at room temperature (C) highest occupied level at 0 K (D) highest occupied level at room temperature	(A)
613	187	Quantum of lattice vibration energy is called (A) photon (B) phonon (C) solitron (D) meson	(B)
613	188	A pure semiconductor is essentially an insulator at (A) 0 K (B) 100 K (C) 0oC (D) 273 K	(A)
613	189	In the case of an intrinsic semiconductor, Fermi level (A) does not exist (B) lies close to the conduction band (C) lies close to the valence band (D) lies in the middle of the energy band gap	(D)
613	190	Atoms with nuclear spin I = $\frac{1}{2}$ cannot have (A) magnetic interaction (B) electric quadruple interaction (C) fine structure (D) hyperfine structure	(B)
613	191	Heisenberg uncertainty principle applies to (A) any pair of dynamical variables	(D)

		(B) x and px only (C) a pair of dynamical variables, the operators corresponding to which commute (D) a pair of dynamical variables, the operators corresponding to which do not commute	
613	192	A state of two electrons (1 and 2) with effective spin S=1 and Ms = 1 is represented by (A) α(1)β(2) (B) α(1)α(2) (C) β(1)α(2) (D) β(1)β(2)	(B)
613	193	The change in internal energy of the gas is directly proportional to (A) the change in volume (B) change in temperature (C) change in pressure (D) change in chemical potential	(B)
613	194	Which one of the following is not an exact differential? (A) dQ (Q = heat absorbed or released) (B) dU (U = internal energy) (C) dS (S = entropy) (D) dF (F = free energy)	(A)
613	195	The existence of a given substance in more than one crystalline forms possessing different physical properties is known as (A) ﷺ isomorphism (B) polymorphism (C) ﷺ triple point (D) anisotropy	(B)
613	196	The phenomenon of diffusion occurs in (A) gases only (B) gases and liquids only (C) liquids only (D) solids, liquids and gases	(D)
613	197	A JFET differs from MOSFET mainly because (A) of the power rating (B) the MOSFET has two gates (C) the JFET has a pn junction (D) MOSFET does not have a physical channel	(C)
613	198	Light Emitting Diode (LED) emits visible light when its (A) pn-junction is reverse biased (B) holes and electrons recombine (C) pn-junction becomes hot	(B)

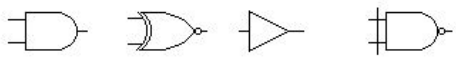
		(D) depletion region widens	
613	199	A solar cell operates on the principle of (A) diffusion of charge carriers (B) recombination of charge carriers (C) photovoltaic action (D) injection of current	(C)
613	200	Accuracy of an experiment expresses (A) correctness of the experiment (B) deviation of the measured value from the predicted value (C) feasibility of the experiment (D) reproducibility of the experiment	(A)
613	201	Pirani gauge for the measurement of low pressure is based on the principle of measurement of (A) humidity of the medium (B) electrical conductivity of the medium (C) thermal conductivity of the medium (D) dielectric property of the medium	(C)
613	202	For an ideal operational amplifier, the input current is (A) infinite (B) zero (C) large (D) of the order of mA	(B)
613	203	Spin multiplicity of the state 2D3/2 is (A) 2 (B) 1 (C) 3/2 (D) 3	(A)
613	204	Which one of the following molecules does not exhibit a pure rotational spectrum? (A) HCl (B) CO (C) OCS (D) H2	(D)
613	205	The splitting of the spectral lines of an atom in the presence of an electric field is called (A) Zeeman effect (B) Raman effect (C) Stark effect (D) Paschen-Back effect	(C)
613	206	Which one of the following is the weakest kind of bonding in solids?	(C)

		(A) Ionic (B) Covalent (C) Van der Waals (D) Metallic	
613	207	In a crystal lattice, an electron occupies a negative ion vacancy in the lattice. The lattice defect is then (A) interstitial (B) colour centre (C) Schottky defect (D) Frenkel defect	(B)
613	208	In the case of a metal, the resistivity (A) increases with temperature (B) decreases with temperature (C) is independent of temperature (D) decreases initially with temperature but increases with further increase in temperature	(A)
613	209	Nuclear forces are (A) short range, attractive and charge independent forces (B) short range, attractive and charge dependent forces (C) long range, repulsive and charge independent forces (D) long range, repulsive and charge dependent forces	(A)
613	210	The resolving power of a grating is (A) directly proportional to the number of lines N (B) inversely proportional to N (C) independent of N (D) directly proportional to N2	(A)
613	211	The ratio of proton mass to electron mass is (A) 1.837 (B) 1837 (C) 18.37 (D) 183.7	(B)
613	212	The reciprocal lattice of bcc lattice is (A) bcc lattice itself (B) hcp lattice (C) fcc lattice (D) simple cubic lattice	(C)
613	213	Glass is a (A) crystalline solid (B) amorphous solid	(B)

		(C) liquid crystalline material (D) polymeric material	
613	214	The rank of the matrix $\begin{pmatrix} 7 & -1 \\ 2 & 1 \end{pmatrix}$ is (A) 9 (B) 2 (C) 1 (D) 5	(B)
613	215	If $m\vec{i} + 2\vec{j} + \vec{k}$ and $4\vec{i} - 9\vec{j} + 2\vec{k}$ are perpendicular to each other, then m is (A) –4 (B) 8 (C) 4 (D) 12	(C)
613	216	If $m\vec{i} + 2\vec{j} + \vec{k}$ and $4\vec{i} - 9\vec{j} + 2\vec{k}$ are perpendicular to each other, then m is (A) 2coshq (B) coshq (C) 2sinhq (D) sinhq	(A)
613	217	The axis of the parabola y2 = 4x is (A) x = 0 (B) y = 0 (C) x = 1 (D) y = 1	(B)
613	218	The order and degree of the differential equation $\frac{d^3y}{dx^3} + \left(\frac{d^2y}{dx^2}\right)^3 + \left(\frac{dy}{dx}\right)^5 + y = 7$ are (A) 3 and 1 (B) 1 and 3 (C) 3 and 5 (D) 2 and 3	(C)
613	219	When a p-n diode is reverse biased, (A) there is some current due to majority carriers (B) there is some current due to minority carriers (C) there is some current due to both majority and minority carriers but in opposite directions (D) there will be no current at all	(B)

613	220	A pentavalent impurity is added to silicon (A) to increase the energy band gap (B) to create an n-type semiconductor (C) to create a p-type semiconductor (D) to decrease the energy band gap	(B)
613	221	A JFET is a (A) current controlled device (B) voltage controlled device (C) charge controlled device (D) light controlled device	(B)
613	222	The input impedance of an ideal operational amplifier is (A) zero (B) low (C) infinity (D) high	(C)
613	223	A Zener diode is used for voltage regulation in (A) forward bias (B) reverse bias (C) no bias is needed (D) it cannot be used for voltage regulation	(B)
613	224	A certain operational amplifier has an open loop gain of 200,000 and a common-mode gain of 0.8. Then the common-mode rejection radio (CMRR) of this operational amplifier is (A) 250000 (B) 125000 (C) 0.4 (D) 4.0E-6	(A)
613	225	Which of the following gates are known as universal gates? (A) OR Gate and AND gate (B) OR gate and EXOR gate (C) AND gate and NOT gate (D) NAND gate and NOR gate	(D)
613	226	As the temperature increases, the resistivity (A) increases for metals and semiconductors but decrease for insulators (B) decreases for metals and semiconductors but increases for insulators (C) increases for metals but decreases for semiconductors and insulators (D) decreases for metals but increases for semiconductors and insulators	(C)
613	227	A vector is solenoidal if (A)	(B)

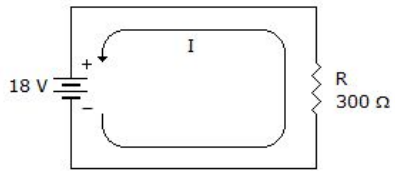
		$\nabla \times F = 0$ (B) $\nabla \bullet F = 0$ (C) $\nabla \times \nabla \times F = 0$ (D) $\nabla^2 \times F = 0$	
613	228	A car undergoes a constant acceleration of 6 m/s2 starting from rest. In the first second it travels (A) 6 m (B) 16 m (C) 3 m (D) 36 m	(C)
613	229	A 1 kg mass has a potential energy of 1 Joule relative to the ground when it is at a height of (A) 1 m (B) 0.102 m (C) 9.8 m (D) 32.0 m	(B)
613	230	A car moving at 20 m/s along a straight road with its 500 Hz horn sounding. You are standing at the side of the road. What frequency will you hear as the car is approaching? (A) 500 Hz (B) 472 Hz (C) 531 Hz (D) 513 Hz	(C)
613	231	A thermo dynamical process is explained by means of the work done $W = \int_{v1}^{v2} PdV$ for $V_1 < V_2$, the process is called (A) isobaric process (B) isothermal process (C) isentropic process (D) adiabatic process	(A)
613	232	The average kinetic energy of the molecules in a gas is given by (A) $E = \frac{3PV}{2N}$ (B) $E = \frac{3P}{2N}$ (C) $E = \frac{3NK}{2}$	(A)

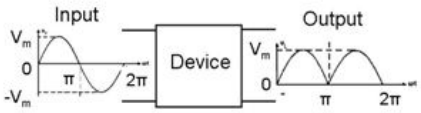
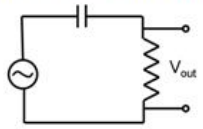
		(D) $E = \frac{3KP}{2}$	
613	233	The nitrogen liquid boils at 77 K at atmospheric pressure. Which can be a valid suggestion to keep it in liquid state at higher temperature. (A) increase the pressure (B) increase the volume (C) decrease the pressure (D) maintain constant volume	(A)
613	234	Energy is absorbed or liberated as heat when a current flows along an unequally heated conductor depending upon the direction of flow of the current. The effect is called (A) Thomson effect (B) Peltier effect (C) Seebeck effect (D) Stark effect	(A)
613	235	The primary circuit of a potentiometer consists of a storage cell of e.m.f. 2 Volts with negligible internal resistance. If the potentiometer wire is 500 cm and its resistance is 5 Ohms, the length of the wire required to balance a Daniel cell of e.m.f 1.08 Volts is given by (A) 27 cm (B) 270 cm (C) 2.7 cm (D) 0.27 cm	(B)
613	236	For soft magnetic material the magnetic susceptibility is (A) small (B) large (C) zero (D) negative	(B)
613	237	Which of the figures shown below represents the exclusive-NOR gate?  a. b. c. d. (A) a (B) b (C) c (D) d	(B)
613	238	Quincke's method is used to find the magnetic susceptibility of (A) solids (B) solids and Liquids (C) liquids (D) plasmas	(C)

613	239	Positronium is a bound state of (A) a proton and a positron (B) an electron and a positron (C) proton and an electron (D) photon	(B)
613	240	Which of the following is not a moderator in an atomic pile? (A) heavy water (B) graphite (C) beryllium (D) boron	(D)
613	241	Mirage effect is due to variation in (A) the refractive index of the medium (B) the wavelength of light (C) the energy of light (D) fluctuations of the size of the object	(A)
613	242	Polarization of waves can be best understood due to (A) wave nature of light (B) particle nature of light (C) Both (A) and (B) (D) dispersion	(A)
613	243	The existence of electromagnetic waves was confirmed experimentally by (A) Hertz (B) Maxwell (C) Huygens (D) Planck	(A)
613	244	White light illuminates a single slit of width 'x'. The first minimum for red light (λ=650 nm) occurs at θ =15o. The width 'x' is then (A) 430 nm (B) 650 nm (C) 2510 nm (D) 1255 nm	(C)
613	245	The number of photons emitted per second from a 1 Watt Ar-ion laser operating at 488 nm is approximately (A) 10.23$\diamond$1019 (B) 2.46$\diamond$1018 (C) 10.23$\diamond$1017 (D) 2.46$\diamond$1015	(B)
613	246	In Young's double slit experiment with a Helium-Neon laser beam of wavelength 632 nm, the first interference maximum will occur when (A) path difference is 948 nm	(C)

		(B) path difference is 316 nm (C) phase difference is2 π radians (D) phase difference is 2π radians	
613	247	The change of orientation of the molecule takes place in ..... region of electromagnetic spectrum (A) X-ray (B) Visible (C) γ-ray (D) Microwave	(D)
613	248	de Broglie waves can be regarded as waves of (A) energy (B) electric charge (C) momentum (D) probability	(D)
613	249	Wave behavior is exhibited by (A) only particles at rest (B) only moving particles (C) only charged particles (D) all particles	(B)
613	250	The velocity of the wave packet that corresponds to a moving particle is (A) lower than the particle velocity (B) equal to the particle velocity (C) higher than the particle velocity (D) zero	(B)
613	251	For a perfect black body, the absorptive power is (A) 0 (B) ∞ (C) 1 (D) 0.5	(C)
613	252	A hydrogen atom is in its ground state when its electron is (A) at rest (B) inside the nucleus (C) in its lowest energy level (D) in its highest energy level	(C)
613	253	A photon is emitted by an atom when one of the electrons of the atom (A) leaves the atom (B) collides with another of its electrons	(C)

		(C) shifts to a lower energy level (D) shifts to a higher energy level	
613	254	The number of atoms per primitive unit cell is (A) 1 (B) 2 (C) 3 (D) 4	(A)
613	255	The number of allowed orientations for orbital angular momentum for the state with (A) 0 (B) 1 (C) 2 (D) 3	(D)
613	256	Young's modulus of a perfectly rigid body is (A) zero (B) unity (C) infinity (D) more than zero but less than infinity	(C)
613	257	Decibel is (A) a musical instrument (B) a musical note (C) a measure of sound level (D) the wavelength of noise	(C)
613	258	A p-n junction is formed by (A) the recombination of electrons and holes (B) ionization (C) the boundary of a p-type and an n-type semiconductors (D) heating	(C)
613	259	Curie temperature is the temperature above which (A) a paramagnetic material becomes diamagnetic (B) a ferromagnetic material becomes diamagnetic (C) a paramagnetic material becomes ferromagnetic (D) a ferromagnetic material becomes paramagnetic	(D)
613	260	The process of superimposing signal frequency on the carrier wave is known as (A) transmission (B) reception (C) modulation (D) detection	(C)

613	261	A simple isolated lattice vacancy is known as (A) Schottky defect (B) Frenkel defect (C) Fink defect (D) Laue defect	(A)
613	262	Equivalent matrices are obtained by (A) taking inverses (B) taking transposes (C) taking adjoints (D) taking finite number of elementary transformations.	(D)
613	263	The distance–time relationship of a moving body is given by y = F(t) then the acceleration of the body is the (A) gradient of the velocity versus time graph (B) gradient of the distance versus time graph (C) gradient of the acceleration versus time graph (D) gradient of the velocity versus distance graph	(A)
613	264	An object dropped from the sky follows the law of motion $x = \frac{1}{2}gt^2$ ($g = 9.8 m/sec^2$). Then the acceleration of the object (A) varies with time (B) constant with time (C) varies with velocity (D) varies with square of distance	(B)
613	265	A trivalent impurity is added to silicon to (A) to increase the energy band gap (B) to create an n-type semiconductor (C) to create a p-type semiconductor (D) to decrease the energy band gap	(C)
613	266	If the voltage in the given circuit below is reduced to half, what would be the current equal to?  (A) 10 mA (B) 30 mA (C) 60 mA (D) 90 mA	(B)

613	267	The output impedance of an ideal operational amplifier is (A) high (B) infinity (C) low (D) zero	(D)
613	268	A flip-flop has (A) one stable state (B) no stable states (C) two stable states (D) None of the above	(C)
613	269	Observe the input and output wave forms of the following device and identify the device  (A) Half-wave rectifier (B) Hartley Oscillator (C) R-C coupled amplifier (D) Full-wave rectifier	(D)
613	270	The rms output voltage of a BJT amplifier is 5 V for an input rms voltage of 500 mV. The voltage gain of this amplifier is (A) 10 (B) 7.07 (C) 14.14 (D) 100	(A)
613	271	The circuit shown in the figure is a  (A) low-pass filter (B) integrator (C) half-wave rectifier (D) high-pass filter	(D)
613	272	An emitter bypass capacitor is used in a CE amplifier to eliminate the (A) AC component of output (B) DC component of output (C) AC drop across RE (D) DC drop across RE	(C)

613	273	Two capillary tubes of different diameter are placed vertically in water. The rise of water is (A) greater in tube of smaller diameter (B) greater in tube of larger diameter (C) same in both (D) zero in both	(A)
613	274	The terminal velocity of a spherical body of radius r falling through a viscous fluid is proportional to (A) 1/r2 (B) 1/r (C) r (D) r2	(D)
613	275	What is the Kilowatt-hour consumption of a 40 W lamp if it remains ON for 1750 hours? (A) 43.75 (B) 70 (C) 43750 (D) 70000	(B)
613	276	Constant volume Hydrogen thermometer works on the basis of (A) Charles's law (B) Boyle's law (C) Van der Waals equation (D) Mayor's relation.	(A)
613	277	A cycle tier bursts suddenly. It is a good example for (A) isentropic process (B) isobaric process (C) isothermal process (D) constant volume process	(A)
613	278	The unit Jm–1s–1k–1 is the unit for (A) thermal conductivity (B) specific heat (C) entropy (D) compressibility	(A)
613	279	According to Claussius, the energy of the universe is constant but its ..... is increasing. (A) entropy (B) enthalpy (C) Gibb's free energy (D) efficiency	(A)
613	280	A solenoid has an inductance of 2 Henrys and a resistance of 1 Ohm. The current to grow to 2/3 of the steady state value, it takes time nearly (A) 20 min	(D)

		(B) 2 sec (C) 2 min (D) 22 sec	
613	281	The thermo electric powers of copper and iron when coupled with lead are 10.8 μV and 3.6 μV respectively at 100oC. The emf developed in an iron-copper couple when the cold and hot junctions are at 50oC and 150oC respectively is (A) 720 μV (B) 72 μV (C) 7.2 μV (D) 0.72 μV	(A)
613	282	A galvanometer of resistance 100 Ohms is shunted with a resistance to lower its sensitiveness 100 times. The value of shunt resistance is (A) 1.01 Ohms (B) 10 Ohms (C) 100 Ohms (D) 10.1 Ohms	(A)
613	283	For hard magnetic materials, the permeability is (A) large (B) small (C) zero (D) negative	(B)
613	284	The susceptibility of a substance given by $\chi m = Cm / (T-\theta)$ represents (A) Curie's law (B) Ampere's law (C) Poisson's law (D) Curie-Weiss Law	(D)
613	285	Guoy's method is used to find the magnetic susceptibility of (A) solids or liquids (B) liquids (C) solids (D) plasmas	(C)
613	286	In two days, the radioactivity of a Radon decreases to 1/1.45 of its initial value. Its half-life is (A) 2 days (B) 2.3 days (C) 3.7 days (D) 4 days	(C)
613	287	If two nuclei of masses m1 and m2 are fused to form a nucleus of mass m and some energy is released, then (A) (m1+ m2) > m (B) (m1+ m2) < m	(A)

		(C) (m1+ m2) = m (D) (m1 – m2) =m	
613	288	Secondary cosmic rays are produced when primary cosmic rays interacts with (A) electrons (B) positrons (C) photons (D) atmospheric gases	(D)
613	289	Intensity of wave falling as 1/r2, where r is the distance from the source is best described by (A) plane waves (B) spherical waves (C) cylindrical waves (D) ultrasonic waves	(B)
613	290	Unpolarized waves can be polarized by (A) dispersion (B) reflection (C) diffraction (D) all of the above	(D)
613	291	Deviation in the light path could be due to (A) reflection (B) refraction (C) scattering (D) All of the above	(D)
613	292	Fresnel diffraction can be best described by (A) near-field diffraction pattern (B) far-field diffraction pattern (C) intermediate-field diffraction pattern (D) wave front independent effect	(A)
613	293	The wavelengths in the emission spectrum of an element are (A) characteristic of the particular element (B) the same for all elements (C) evenly distributed throughout the visible spectrum (D) independent of the nature of the element	(A)
613	294	The operation of the laser is based on (A) the uncertainty principle (B) spontaneous emission of radiation (C) induced emission of radiation (D) interference of matter waves	(C)

613	295	Which one of the following wave function cannot be a solution of Schrodinger's equation for all values of x? (A) ψ = Asec (x) (B) ψ = Asin (x) (C) ψ = Aexp (x2) (D) ψ = Aexp (–x2)	(A)
613	296	Orthorhombic crystal structure is defined by (A) a = b = c, a = b = g = 90o (B) a ≠ b = c, a = b = g = 90o (C) a ≠ b ≠ c, a = b = g = 90o (D) a ≠ b ≠ c, a = b = g ≠ 90o	(C)
613	297	Ohm's law related to electric field strength (E), conductivity (σ) and current density (J) is (A) J = E/ σ (B) J = σE2 (C) J = σ/ E (D) J = σ E	(D)
613	298	In photoelectric effect, the photoelectric current (A) increases when frequency of incident photons increases (B) decreases when frequency of incident photons increases (C) does not depend on frequency but depends on intensity of incident beam (D) depends both on intensity and frequency of incident beam	(C)
613	299	Two identical fuses are rated at 10 A (A) in parallel, the combination acts as a fuse of rating 10 A (B) in parallel, the combination acts as a fuse of rating 20 A (C) in series, the combination acts as a fuse of rating 20 A (D) in series, the combination acts as a fuse of rating 5 A	(B)
613	300	The masses of an ion liberated from different electrolytes by the same current flowing for the same time are proportional to the chemical equivalent of the liberated ions. This law is (A) Faraday's Law (B) Joule's Law (C) Thomson's Law (D) Ohm's law	(A)