eExam Question Bank

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Question Type	Question	A	B	C	D
FBQ	The splitting of a heavy nucleus into a lighter one with the release of energy is called nuclear [ ]	fission	fission		
FBQ	The atomic mass of a nucleus iin atomic mass units is approximately given by the number of its [ ]	nucleons	nucleons		
FBQ	The quantity λN represents the [ ] of a radioactive sample	activity	activity		
FBQ	A sequence of nuclides, each of which transforms by radioactive disintegration into the next, until a stable nuclide is reached is called [ ] _.	radioactive series	decay series		
FBQ	The time taken for radioactive nuclei to decay by half its original (or initial) quantity is called its [ ]	half-life	half-life		
FBQ	An electric [ ] consists of a system of two point charges seperated by a small distance.	dipole	dipole		
FBQ	In the equation $\frac{dN}{dt} = -\lambda N$, N is the number of nuclides present in the radioactive substance at a given time. The quantity λ is called the [ ]	radioactive decay constant	decay constant		
FBQ	The [ ] law states that the rate of disintegration of a given nuclide at anytime is directly proportional to the number of nuclei of the nuclide present at that time	radioactive decay	decay		

	FBQ	The spontaneous emission of particles and radiation by unstable nuclides to become stable is known as [ ]	radioactivity	radioactivity		
	FBQ	How many neutrons are in the nucleus of $^{21}_{10}Ne$? [ ]	11	11		
	FBQ	An atom whose nucleus contains the same number of protons but different number of neutrons is called [ ]	isotope	isotope		
	FBQ	The chemical identity of an atom is determined by the number of [ ] in its nucleus	protons	protons		
	FBQ	The lightest nuclides have almost [ ] number of protons and protons	equal	the same		
	FBQ	The difference in mass between the total mass of individual protons and neutrons and the mass of the nucleus is reffered to as [ ]	mass defect	mass defect		
	FBQ	The energy needed to be added to the nucleus to separate it into individual protons and neutrons is called [ ] energy	binding	binding		
	FBQ	which of the following properties (wavelength, energy, position, momentum) is not quantized? [ ]	position	position		
	FBQ	As the speed of a particle increases, the de Broglie wavelength of the particle [ ]	decreases	decreases		
	FBQ	The wave behaviour of a football is not observed because its [ ] is too small	wavelength	wavelength		
	FBQ	Which of the terms (wavelength, mass, energy, momentum) cannot be used to describe both an electron and a photon? [ ]	mass	mass		
	FBQ	If electrons in hydrogen atoms are excited to the fourth Bohr orbit , how many different frequencies of light may be emitted? [ ]	6	six		

	FBQ	Diffraction, interference, reflection, refraction, polarization, and superposition are wave properties are while mass and momentum are [ ] properties of matter	particle	particle		
	FBQ	The equation $$\lambda=\frac{h}{p}$$ is known as the [ ] equation	de Broglie	de Broglie		
	FBQ	Wave – particle [ ] means that matter exhibit wave properties and particle properties.	duality	duality		
	FBQ	The state of an atom is specified by [ ] quantum numbers	four	4		
	FBQ	The rotation and the [ ] of eleectrons gives rise to the magnetic propperty of an atom	spin	spin		
	FBQ	In the Bohr model of the atom, $$r_{n}=\frac{\epsilon_{0}n^{2}h^{2}}{\pi{m}e^{2}}$$ means the orbital radii are [ ]	quantised	quantized		
	FBQ	$$K_{\gamma}$$ x-ray is produced when electrons from [ ] shell move in to fill the gap in the K-shell	N	N		
	FBQ	$$K_{\beta}$$ x-ray is produced when electrons from [ ] shell move in to fill the gap in the K-shell	M	M		
	FBQ	[ ] – series X – ray are produced when an electron is knocked out of the lowest K – shell.	K	K		
	FBQ	$$K_{\alpha}$$ x-ray is produced when electrons from [ ] shell move in to fill the gap in the K-shell	L	L		
	FBQ	When fast moving electrons are stopped by a metal target, [ ] is produced	x-ray	x-ray		
	FBQ	The statement that "electrons will fill a set of degenerate orbitals by keeping their spin parallel" is [ ] _'s rule	Hund	Hund		
	FBQ	[ ] that ‘‘it is impossible for two electrons with the same spin quantum number to be in the same orbit’’.	Pauli Exclusion Principle	Pauli Exclusion Principle		

	FBQ	For an orbiting electron, $$\vec{\mu}={-}\frac{e}{2m}\vec{L}$$, where $$\mu$$ is the magnetic [ ] and $$\vec{L} the [ ] of the atom	dipole moment, angular momentum	dipole moment, angular momentum		
	FBQ	In Bohr's model, a hydrogen atom is in its [ ] state its electron is in the innermost orbit	ground	ground		
	FBQ	The [ ] 's of the atom was suceesful in explaining the scattering of alpha particles from the gold foil	Rutherford	Rutherford		
	FBQ	In Bohr's model of the atom, the radius, energy and [ ] are quantized	angular momentum	angular momentum		
	FBQ	The relative atomic mass of an element can calculated from the [ ] of its isotopes	relative abundance	relative abundance		
	FBQ	The concept that charge (e) exists in discrete and not in continuous amount. This is referred to as charge [ ]	quantization	quantisation		
	FBQ	The [ ] of the atom is of the order of $$10^{-16}$$ m	radius	radius		
	FBQ	A combination of electric and magnetic field arranged perpendicular to each other in the mass spectrometer is [ ] selector	velocity	velocity		
	FBQ	[ ] _'s model of describes the atom as a very tiny, massive nucleus with the electrons orbiting at distances away from the nucleus	Rutherford	Rutherford		
	FBQ	Thomson's model describes an atom as a homogeneous sphere of positive charges inside of which negatively charged electrons are evenly distributed. This model is otherwise reffered to as the [ ] model	plum pudding	plum pudding		
	FBQ	The quantity $$ \lambda=\frac{activity}{number of undecayed nuclei}$$ defines [ ] constant of a radioactive nuclide	decay	decay		

	FBQ	Isotopes are elements with same number of [ ] but different number of [ ]	protons, neutrons	protons, neutrons		
	FBQ	The stability of the atom depends on the number of [ ] and [ ] in the atom	protons, neutrons	neutrons, protons		
	FBQ	Binding energy per nucleon = [ ] /total number of protons and neutrons	bindine energy	binding energy		
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	MCQ	What daughter is formed when $$^{18}_{7}N$$ decays by decay beta decay	$$^{18}_{8}O$$	$$^{18}_{6}C$$	$$^{19}_{8}O$$	$$^{17}_{6}(
	MCQ	How many neutrons are in the nucleus of $$^{47}_{18}Ar$$	18	29	27	65

	MCQ	The chemical identity of an atom is determined by the number of ---------- in its nucleus	protons	neutrons	electrons	nucleons
	MCQ	How many quantum states are there in n = 3?	6	8	12	18
	MCQ	The deBroglie waves can be regarded as ---------- waves	pressure	probability	electromagnetic	gravitational
	MCQ	A bullet has a mass of 10 g and the muzzle velocity of 900 m/s. What is its de Broglie wavelength?	$$1.47\times10^{-39}m$$	$$2.21\times10^{-38}m$$	$$1.99\times10^{-29}m$$	$$2.98\times
	MCQ	As the speed of a particle increases, the de Broglie wavelength of the particle	increases	decreases	stays the same	the wavelen
	MCQ	The wave behaviour of tennis balls is not observed because	their speed is too small	their momenta are too small	their wavelengths are too small	wave proper the atomic s
	MCQ	Which of the following terms cannot be used to describe both an electron and an atom?	wavelength	mass	energy	momentum
	MCQ	Bohr's model predicts that the energies of an element's characteristic X rays	increase with increase in atomic number	decrease with increase in atomic number	increase with increase in atomic mass	decrease wi atomic mass
	MCQ	The spikes in the spectrum of X-rays are due to	electrons slowing down in the material	electrons knocked from the outer shell	photons emitted by electrons dropping to fill the inner shell	photons abs electrons in
	MCQ	Sulphur is element number 16. how many electrons do you expect to find in each shell of the sulphur atom?	2,8,6	4,4,4,4	2,4,6,4	2,7,7
	MCQ	The statement that "no two electrons can have the same set of quantum numbers" is ----------	Hund's rule	correpondence principle	complemntarity principle	Paili's exclus
	MCQ	Given the quantum number n=1 for a hydrogen atom, which of the following correctly represents the value of its magnetic moment?	$\frac{e\hbar}{m}$	$\frac{e\hbar}{2m}$	$\frac{2m}{e\hbar}$	$\frac{m}{e\h
	MCQ	In the hydrogen atom, if the quantum number n=3, what values can l take on?	0,1	0,1,2,3	1,2,3	0,1,2
	MCQ	The orbital quantum number determines the ---------- of the atom	total energy	orientation of the angular momentum	the angular	spin magnet
	MCQ	If the energy of the Bohr hydrogen atom is greater than zero, then the	atom is in the excited state	the atom is in the ground state	the electron is no longer bound to the nucleus	the atom em
	MCQ	"An electron can circle an atomic nucleus indefinitely without radiating energy if its orbit an integral number of electron wavelengths in circumference" is a statement of ----------	Bohr's theory of the hydrogen atom	Planck's quantisation condition	Heisenberg's uncertainty principle	de Broglie's particle dual
	MCQ	The plum pudding model of the atom was proposed by ----------	Ernerst Rutherford	Neils Bohr	J. J. Thomson	Max Planck

	MCQ	An electron in the ground state of the Bohr atom has a radius of 0.053 nm. What is the radius of the first excited state?	0.053 nm	0.106 nm	0.159 nm	0.212 nm
	MCQ	Which of the following is quantised in the Bohr model?	radius	angular momentum	energy	All of these a
	MCQ	Which of the following is NOT a feature of the Bohr model of the atom?	an electron probability cloud	electron in planetary-like orbit	quantised energy levels	accelerating not radiate
	MCQ	The three naturally occuring isotopes of neon are $^{20}_{10}{Ne}$, $^{21}_{10}{Ne}$, $^{22}_{10}{Ne}$. Given that the atomic mass of natural neon is 20.18 atomic mass units, Which of these three isotopes must be the most common	$^{20}_{10}{Ne}$	$^{21}_{10}{Ne}$	$^{22}_{10}{Ne}$	They are eq
	MCQ	The chemical identity of an atom is determined by the the number of ---------- in its nucleus	protons	neutrons	electrons	neucloens
	MCQ	Atoms whose nuclei contain the same number of protons but different numbers of neutrons are called	radioactive	daughters	isotopes	nucleons
	MCQ	Which of the following is NOT considered to be a success of Bohr's theory of the atom?	Obtaining the numarical values for the spectral lines in hydrogen	Explaining why there are more lines in emission spectra than the absorption spectra	Explaining why electrons in fixed orbits do not radiate	Providing th features of t
	MCQ	Find the radius of the path of a charged particle whose velocity is $$10^{7}$$ in a magnetic field of 0.02 T when the particle's path is perpendicular to the field. The mass and charge of the particle is $$9.1x10^{-31} kg$$ and $$1.6x10^{-19}$$ respectively	28 cm	34 cm	46 cm	17 cm
	MCQ	An electric field of 50 kV/m is perpendicular to a magnetic field of 0.25 T. What is the velocity of a charge q whose initial direction is perpendicular to both fields and which passes through the fields undeflected	$$2x10^{5}$$	$$2..5\times{10^{6}}$$	$$2..0\times10^{4}$$	$$2.5\times{
	MCQ	The term charge quantization refers to the fact that	any charge is an integral multiple of the electronic charge	charge is conserved	an atom which looses electrons is positvely charged	an aton is el
	MCQ	The estimate of the atomic radius is of the oder of ----------	$$10^{-10} m$$	$$10^{-16} m$$	$$10^{-7} m$$	$$10^{-32} r
	MCQ	The interaction which is responsible for the existence of bulk matter is the ----------	gravitational interaction	strong interaction	electromagnetic interaction	weak interac
	MCQ	Which of the following is NOT true about the atom?	The nucleus contains protons and neutrons	The protons are chargeless	The electrons are negatively charged	Electrons oc
	MCQ	Calculate the wavelength associated with the motion of a 46 g golf ball at a speed of 36 m/s. Take $$h=6.63\times10^{-34}$$ Js	$$5.0\times{10^{43}} m$$	$$7.0\times{10^{-10}} m$$	$$3.0$\times{10^{-31}}m$$	4.0\times{10

	MCQ	Which of the following experiments does NOTdemonstrate the wavw property of matter ?	x-ray diffraction	electron diffraction	photoelectric effect	polarization electromagn
	MCQ	Which of the following is NOT correct about x-ray spectra?	They K-series x-rays are of shorter wavelengths than the L-series x-rays	The K-series x-rays are less penetrating than the L-series x-rays	They L-series x-rays are of shorter wavelengths than the M-series x-rays	The K-series harder than rays
	MCQ	Which of the following is correct about x-ray spectra?	$$K_{\alpha}$$ x-ray have shorter wavelength than $$K_{\beta}$$ x-ray	$$K_{\gamma}$$ x-ray have longer wavelength than $$K_{beta}$$ x-ray	$$K_{\alpha}$$ x-ray have higher frequency than $$K_{\beta}$$ x-ray	$$K_{\alpha lowerr frequ $$K_{\beta}
	MCQ	Which of the following is the correct about X-rays	They are produced when fast moving electrons are stopped by a metal target	They ate fast moving alpha-particles	They are produced when fast moving electrons are slowed down by very high stopping electric potential	They can be strong electr fields
	MCQ	What is the value of the orbital angular momentum quantun number l for the ground state of the hydrogen atom?	1	0	2	3
	MCQ	What is the number of permitted orientations the orbital angular momentum for l = 3?	3	2	7	5
	MCQ	Which of the following is the correct electronic configuration of magnesium (Z = 12)	$$2s^{2}2s^{2}2p{8}$$	$$2s^{2}2s^{2}2p^{6}2s^{2}$$	$$2s^{2}2s^{1}2p^{6}3s^{2}$$	$$2s^{2}2s^
	MCQ	The atomic number of sulfur is 16. How many electrons do you expect to find in each shell of a sulphur atom in its ground state?	2, 8, 6	4, 4, 4, 4	2, 4, 6, 4	2, 7, 7
	MCQ	A beam of electrons enters a uniform magnetic field of 1.2 T. Calculate the energy difference between electrons whose spins are parallel and antiparallel to the field .	$$1.39\times{10^{-4}}$eV$$	$$2.2\times{10^{-23}} eV$$	$$1.72\times{10^{-3}} eV$$	$$2.44\times
	MCQ	An electron in $$He^{+} $$ is in an n = 2 orbit. According to Bohr's theory, what is its magnetic moment due to its orbital motion?	$$2.32\times{10^{-23}} J/T$$	$$1.31\times{10^{-23} }J/T$$	$$3.22\times{10^{-23}} J/T$$	$$4.54\times
	MCQ	Calculate the wavelength in nanometers of photons having an energy of 1.80 eV	691 nm	342 mn	590 nm	342 nm
	MCQ	If electrons in hydrogen atoms are excited to the fourth Bohr orbit, how many different frequencies of light may be emitted?	1	3	6	8
	MCQ	Two hydrogen atoms have electrons in the n =3 energy level. One of the electrons jumps to the n = 2 level, while the other jumps to the n = 1. which property is larger for the first photon?	velocity	frequency	wavelength	energy
	MCQ	A gas can be identified by means of its spectral lines because each element	can be recognized when greatly magnified	ocupies a unique position in the periodic table	emits characteristic wavelengths when electrically excited	has different

☐	MCQ	A spectral line is emitted when an atom undergoes a transition between two levels with a difference of 2.4 eV. What is the wavelength of the line?	490 nm	518 nm	615 nm	249 nm
☐	MCQ	In a transition to a state of excitation energy 10.19 eV ahydrogen atom emits 4890 A photon. Determine the binding energy of the intial state	0.37 eV	0.87 ev	0.43 eV	0.67 eV
☐	MCQ	The energy of a hydrogen atom when its electron that orbits in its smallest possible orbit is called ----------	excited state	ionised state	ground state	sationary sta

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