Q.1	Two elements A and B with atomic numbers Z_A and Z_B are used to produce characteristic X-rays with frequencies VA and VB respectively. If $Z_A:Z_B=1:2$, then VA: VB will be									
	(A) 1:√2 (B) 1:8		(C) 4:1	(D) 1:4						
Q.2	The electron beam in a colour TV is accelerated through 32 kV and then strikes the screen. What is the wavelength of the most energetic X-ray photon?									
	(A) 38.8 pm	(B) 48.8 pm	(C) 58.8 pm	(D) 68.8 pm						
Q.3	What potential of wavelength r	difference should be appli 10t less than	ed across an X-ray tube t	o get an X-ray tube to get an X-ray						
	(A) 12.4 kV	(B) 12.4 MV	(C) 12.4 V	(D) 12.4 eV						
Q.4	Electrons with the emitted X- r	de-Broglie wavelength λ fa ays is:	all on the target in an X-ra	y tube. The cut-off wavelength of						
	$(\mathbf{A})\Lambda 0 = \frac{2\mathrm{mc}\lambda^2}{h} \qquad \qquad (\mathbf{B})\lambda 0 = \frac{2h}{\mathrm{mc}}$		(C) $\lambda 0 = \frac{2m^2c^2\lambda^3}{h^2}$	$\mathbf{(D)}\lambda 0 = \lambda$						
Q.5	The longest wavelength that can be analyzed by a sodium chloride crystal of spacing d=2.82Å in the second order is -									
	(A) 2.82Å	(B) 5.64Å	(C) 8.46Å	(D) 11.28Å						
Q.6	The wavelengths of K α and L α X-rays of a material are 21.3 pm and 141 pm respectively. Fin wavelength of K β X-ray of the material.									
	(A) 10 pm	(B) 37 pm	(C) 18.5 pm	(D) 47.5 pm						
Q.7	K α wavelength emitted by an atom of atomic number $Z = 11$ is λ . Find the atomic number for an atom that emits K α radiation with wavelength 4λ									
	(A) Z = 6	$(\mathbf{B})\mathbf{Z}=4$	(C) Z = 11	(D) $Z = 44$						
Q.8	The wavelength of K α X-ray of tungsten is 21.3 pm. It takes 11.3 keV to knock out an electron from the L-shell of a tungsten atom. What should be the minimum accelerating voltage across an X-ray tube having a tungsten target which allows production of K α X-ray? (Hc = 1242 eV-nm) (A)53.8 kV (B)74.5 kV (C) 89.2 kV (D)69.6 kV									
Q.9	Electrons with energy 80 keV are incident on the tungsten target of an X-ray tube. K shell electrons of tungsten have ionization energy 72.5 keV. X-rays emitted by the tube contain only (A)A continuous X-ray spectrum (Bremsstrahlung) with a minimum wavelength of nearly ~0.155 A (B)A continuous X-ray spectrum (Bremsstrahlung] with all wavelengths (C)The characteristic X-rays spectrum of tungsten (D)A continuous X-ray spectrum (Bremsstrahlung) with a minimum wavelength of ~0.155 A and									
	the characteristic x-ray spectrum of tungsten									
Q.10	The short-wavelength limit shifts by 26 pm when then operating voltage in an X-ray tube is									

Q.10The short-wavelength limit shifts by 26 pm when then operating voltage in an X-ray tube isincreased to 1.5 times the original value. What was the original value of the operating voltage?(A)25.56 kV(B)36.78 kV(C) 15.93 kV(D)8.12 kV

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ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(D)	(A)	(A)	(A)	(A)	(B)	(A)	(D)	(D)	(C)