

**F.Y.B.Sc. Semester I January 2021**

**Physics Paper II**

**Modern Physics [USPH102]**

**Sample Questions**

1	$^{27}\text{Mg}_{12} \longrightarrow \text{_____} + ^{27}\text{Al}_{13}$
	(a) $\gamma$ radiations + positron
	(b) $\gamma$ radiations + electron
	(c) $\alpha$ particle
	(d) only $\gamma$ radiations
2	The half life of $^{198}\text{Au}$ is 2.7 days. Its decay constant :
	(a) $4.28 \times 10^{-6}/\text{sec}$
	(b) $2.97 \times 10^{-6}/\text{sec}$
	(c) 0.37/day
	(d) 1/day
3	The following radioactive series terminates on Bi as stable product :
	(a) $4n$
	(b) $4n + 1$
	(c) $4n+2$
	(d) $4n+3$
4	When the impact parameter is less than the radius of the nucleus, then ( one of the following statement is wrong)
	(a) the deflection of $\alpha$ -particle is less
	(b) the force of nuclear charge above and below the path of the $\alpha$ -particle acts in opposite directions
	(c) the $\alpha$ -particle passes through the nucleus
	(d) this deflection helps in determination of the radius of the nucleus

5	The value of packing fraction of _____ is closer to zero	
	(a)	$^{16}\text{O}$
	(b)	$^4\text{He}$
	(c)	$^{12}\text{C}$
(d)	$^{235}\text{U}$	
6	Heavy charged particles lose more energy per unit length of the path ____.	
	(a)	above their range
	(b)	in between their range
	(c)	at the start of their range
(d)	near the end of their range	
7	If the energy of an $\alpha$ -particle is 3.5 MeV and energy required to create one ion-pair is 35 eV then the number of ion-pairs produced is _____.	
	(a)	$2 \times 10^3$
	(b)	$3 \times 10^4$
	(c)	$1 \times 10^5$
(d)	$2 \times 10^6$	
8	For the ionization chamber, the applied voltage is approximately_____.	
	(a)	10 V
	(b)	200 V
	(c)	800 V
(d)	1000 V	
9	If the Q value of a nuclear reaction is negative then the reaction is termed as _____.	
	(a)	Endoergic reaction
	(b)	Exoergic reaction
	(c)	Scattering reaction
(d)	Pickup reaction	

10	In the nuclear reaction $N^{14}(\alpha, x)O^{17}$ , x represents ____.	
	(a)	positron
	(b)	electron
	(c)	neutron
	(d)	proton
11	As the wavelength of the radiation decreases, the intensity of the black body radiations _____.	
	(a)	Increases
	(b)	Decreases
	(c)	First increases then decrease
	(d)	First decreases then increase
12	The sun emits maximum radiation of 0.52 micron meter. Assuming the sun to be a black body, Calculate the surface temperature of the sun	
	(a)	2345 K
	(b)	5573 K
	(c)	9847 K
	(d)	6492 K
13	What did the Davisson-Germer experiment involve?	
	(a)	Firing electrons at a lattice.
	(b)	Shining light on a metal.
	(c)	Firing alpha particles at gold foil.
	(d)	Shining light through a glass block.
14	X-ray crystallography uses which characteristic of light?	
	(a)	Polarization
	(b)	Interference
	(c)	Diffraction

	(d)	Coherency
15	What is Compton shift?	
	(a)	Shift in velocity
	(b)	Shift in charges
	(c)	Shift in radiation
	(d)	Shift in wavelength