# DPP
### DAILY PRACTICE PROBLEMS

Class : XIIth                                    Subject : PHYSICS
Date :                                           DPP No. : 4

## Topic :-Nuclei

.1. A nuclear bomb exploded 200 $km$ above the surface of moon. The sound of explosion on the moon
   a) Will be heard before the explosion is seen     b) Will be heard at the same time
   c) Will be heard after explosion                  d) Will not be heard at all

2. An electron jumps from 5th orbit of 4th orbit of hydrogen atom. Taking the Rydberg constant as $10^7 per\ metre$ what will be the frequency of radiation emitted
   a) $6.75 \times 10^{12} Hz$     b) $6.75 \times 10^{14} Hz$     c) $6.75 \times 10^{13} Hz$     d) None of these

3. The fact that photons carry energy was established by
   a) Doppler's effect     b) Compton's effect     c) Bohr's theory     d) Diffraction of light

4. The ratio of the longest to shortest wavelengths in Brackett series of hydrogen spectra is
   a) $\dfrac{25}{9}$     b) $\dfrac{17}{6}$     c) $\dfrac{9}{5}$     d) $\dfrac{4}{3}$

5. After two hours, one-sixteenth of the starting amount of a certain radioactive isotope remained undecayed. The half life of the isotope is
   a) 15 $minutes$     b) 30 $minutes$     c) 45 $minutes$     d) 1 $hour$

6. A reaction between a proton and $_8O^{18}$ that produces $_9F^{18}$ must also liberate
   a) $_0n^1$     b) $_1e^0$     c) $_1n^0$     d) $_0e^1$

7. The half-life of a radioactive element is 3.8 days. The fraction left after 19 days will be
   a) 0.124     b) 0.062     c) 0.093     d) 0.031

8. Select the wrong statement
   a) Radioactivity is a statistical process.
   b) Radioactivity is a spontaneous process.
   c) Radioactivity is neutral characteristic of few elements.
   d) Radioactive elements cannot be produced in the laboratory.

9. Half life of a radioactive element is 10 days. The time during which quantity remains 1/10 of initial mass will be
   a) 100 days     b) 50 days     c) 33 days     d) 16 days

10. $\mathbf{F}_{pe}$ represents electrical force on proton due to electron and $\mathbf{F}_{ep}$ on electron due to proton in a hydrogen atom.Similarly $\mathbf{F}_{pe}$ represents the gravitational force on proton due to electron and $\mathbf{F}_{ep}$ the corresponding force on electron due to proton. Which of the following is not true?
   a) $\mathbf{F}_{Pe} + \mathbf{F}_{ep} = 0$     b) $\mathbf{F'}_{Pe} + \mathbf{F'}_{ep} = 0$
   c) $\mathbf{F}_{Pe} + \mathbf{F'}_{Pe} + \mathbf{F}_{ep} + \mathbf{F'}_{ep} = 0$     d) $\mathbf{F}_{Pe} + \mathbf{F'}_{Pe} = 0$

11. An electron changes its position from orbit $n = 4$ to the orbit $n = 2$ of an atom. The wavelength of the emitted radiation is ($R = $ Rydberg's constant)

a) $\dfrac{16}{R}$  b) $\dfrac{16}{3R}$  c) $\dfrac{16}{5R}$  d) $\dfrac{16}{7R}$

12. Nuclear fission was discovered by

a) Ottohann and F. Strassmann  b) Fermi
c) Bethe  d) Rutherford

13. The energy required to excite an electron from the ground state of hydrogen atom to the first excited state, is

a) $1.602 \times 10^{-14} J$  b) $1.619 \times 10^{-16} J$  c) $1.632 \times 10^{-18} J$  d) $1.656 \times 10^{-20} J$

14. If $M$ is the atomic mass and $A$ is the mass number, packing fraction is given by

a) $\dfrac{M}{M-A}$  b) $\dfrac{M-A}{A}$  c) $\dfrac{A}{M-A}$  d) $\dfrac{A-M}{A}$

15. A mixture consists of two radioactive materials $A_1$ and $A_2$ with half lives of $20\ s$ and $10\ s$ respectively. Initially the mixture has $40\ g$ of $A_1$ and $160\ g$ of $A_2$. The amount of the two in the mixture will become equal after

a) $60\ s$  b) $80\ s$  c) $20\ s$  d) $40\ s$

16. The average binding energy per nucleon in the nucleus of an atom is approximately

a) $8\ eV$  b) $8\ KeV$  c) $8\ MeV$  d) $8\ J$

17. The phenomenon of radioactivity is

a) Exothermic change which increases or decreases with temperature
b) Increases on applied pressure
c) Nuclear process does not depend on external factors
d) None of the above

18. The speed of daughter nuclei is

a) $c\,\dfrac{\Delta m}{M + \Delta m}$  b) $c\sqrt{\dfrac{2\Delta m}{M}}$  c) $c\sqrt{\dfrac{\Delta m}{M}}$  d) $c\sqrt{\dfrac{\Delta m}{M + \Delta m}}$

19. The most stable particle in Baryon group is

a) Proton  b) Lamda-particle  c) Neutron  d) Omega-particle

20. A radioactive sample is $\alpha$-emitter with half life 138.6 days is observed by a student to have 2000 disintegration/s. The number of radioactive nuclei for given activity are

a) $3.45 \times 10^{10}$  b) $1 \times 10^{10}$  c) $3.45 \times 10^{15}$  d) $2.75 \times 10^{11}$