27/5/24

DOON UNIVERSITY, DEHRADUN

End Semester Examination, IV Semester, 2024

Department of Physics, School of Physical Sciences

Integrated M.Sc. Physics

Course PHG-104: Elements of Modern Physics

Time Allowed: 2Hours *Maximum Marks: 50*

SECTION: A *(Marks: 2X7 =14)*

1. The wavelength of de-Broglie waves associated with a moving particle is independent of its
(a) mass (b) charge
(c) velocity (d) momentum

2. ϒ –rays are
(a) Single ionised gas (b) Helium Nucleus
(c) Fast moving electron (d) Electromagnetic wave

3. The moderator in a reactor –
(a) Absorbs neutrons (b) Accelerate neutrons
(c) Slow down neutrons (d) Absorb thermal energy

4. The de-Broglie wavelength of a particle is-
(a) Proportional to its mass
(b) Proportional to its energy
(c) Proportional to its momentum
(d) Inversely proportional to its momentum

5. Write down Fission equation.
6. Write down Fusion equation.
7. What is probability in modern physics?

SECTION: B *(Marks: 16)*

8. What is the energy of a photon of wavelength 5500 A°. **2**
9. Find the relation between half life and decay constant. **4**
10. Write down momentum and Energy operators. **2**
11. What is Radioactivity? Discuss the properties of α, β and ϒ radiations. **5**
12. What is N-Z graph? How you can explain stability of nucleus through it. **3**

SECTION: C

(Marks: 10X2=20)

14. Write short notes on any two

(a) Shortcomings of old Physics **(b)** Nuclear reactor **(c)** Heisenberg uncertainty principle

15. Deduce the expression for Energy and wave function for potential step.