(6 pages)

Reg. No. :.....

Code No. : 20049 E Sub. Code : SNPH 4A/ ANPH 41

U.G. (CBCS) DEGREE EXAMINATION, NOVEMBER 2023.

Fourth Semester

Physics

Non-Major Elective — BASIC PHYSICS – II

(For those who joined in July 2017–2020)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

1. Neutron and Proton together is usually called.
   (a) Neutrino (b) Nucleus
   (c) Nuclide (d) Nucleon

2. The S.I. unit of radioactivity is _____.
   (a) faraday (b) kilogram
   (c) becquerel (d) curie

3. Which one shows ferromagnetic materials
   (a) Copper (b) Cobalt
   (c) Aluminium (d) Metal oxides

4. The resistivity of super conducting material
   (a) zero (b) one
   (c) infinite (d) finite

5. Laser is a _____.
   (a) Photonic device
   (b) Electronic device
   (c) Light
   (d) (a) and (b)

6. The method of producing population inversion is called _____.
   (a) pumping
   (b) emission
   (c) absorption
   (d) none of these

7. The theory of relativity was proposed by _____.
   (a) Newton
   (b) Einstein
   (c) Raman
   (d) Heisenberg

8. The dual nature of light was put forward by
   (a) Newton
   (b) Einstein
   (c) De Broglie
   (d) Wien

9. The number of digits in a hexadecimal number system is
   (a) 16 (b) 15
   (c) 14 (d) 13

10. The result of the addition of two binary numbers $(1111)_2$ and $(1100)_2$ is _____.
    (a) 11011 (b) 11111
    (c) 10001 (d) 10101

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Give the three properties of nucleus.

    Or

    (b) Give the properties of α, β and γ rays.

12. (a) Explain conductors.

    Or

    (b) Explain super conductors.

13. (a) Define and give three properties of stimulated emission.

    Or

    (b) Write a short notes on spontaneous emission.

14. (a) Explain time dilation due to relativistic motion.

    Or

    (b) What are the postulates of special theory of relativity?

15. (a) Convert the hexadecimal number $(ABF9)_H$ into equivalent binary number.

Or

(b) Explain Binary Coded Decimal.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain radio carbon dating.

Or

(b) Describe Binding energy with example.

17. (a) What are paramagnetic materials? Give their properties.

Or

(b) What are ferromagnetic materials? Give their properties.

18. (a) Explain in detail about the applications of LASERS.

Or

(b) Explain the construction and working of He-Ne LASER.

19. (a) Derive the expression for the wavelength of a moving particle.

Or

(b) Explain in detail about the dual nature of wave and radiation.

20. (a) Give the block diagram and the truth tables of AND and OR logic gates.

Or

(b) Give the block diagram and the truth tables of NAND and NOR logic gates.

———————