

(6 pages)

Reg. No. :

Code No. : 30468 E Sub. Code : CNPH 41

U.G. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2024.

Fourth Semester

Physics

Non Major Elective — BASIC PHYSICS II

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. The size of nucleus is of the order of
(a) fermi (b) meter
(c) milli meter (d) micro meter
2. Hydrogen bomb works on the principle of
(a) alpha decay (b) nuclear fusion
(c) nuclear fission (d) beta decay
3. The value of susceptibility for paramagnetic material is
(a) negative (b) zero
(c) small and positive (d) infinity
4. Example for insulator is
(a) rubber (b) wood
(c) plastic (d) all the above
5. LASER is a short form of
(a) Light Amplification by Apontaneous Emission of Radiation
(b) Light Absorption by Spontaneous Emission of Radiation
(c) Light Amplification by Stimulated Emission of Radiation
(d) Light Absorption by Stimulated Emission of Radiation
6. The method of population inversion in the He - Ne laser is
(a) Direction conversion
(b) Molecular collision
(c) Optical pumping
(d) Electron impact

7. _____ remains unchanged according to Galilean Transformations.
 (a) Acceleration (b) Velocity
 (c) Displacement (d) Time
8. Special theory of relativity was proposed by
 (a) Lorentz (b) Einstein
 (c) Planck (d) de Broglie
9. The binary equivalent of 7 is
 (a) 1101 (b) 1110
 (c) 0111 (d) 1011
10. The output of AND gate is high if _____ the inputs are in high state.
 (a) any one of (b) two
 (c) three (d) all

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
 Each answer should not exceed 250 words.

11. (a) Define the term mass defect and binding energy.
 Or
 (b) Describe the process of nuclear fission.

12. (a) List the properties of ferro magnetic materials.
 Or
 (b) Explain the following
 (i) conductors and
 (ii) insulators.
13. (a) Describe the term population inversion.
 Or
 (b) List any five uses of lasers.
14. (a) Give the postulates of special theory of relativity.
 Or
 (b) Discuss the dual nature of matter and radiation.
15. (a) Add the binary numbers
 (i) 0101 with 1011
 (ii) 1001 with 0110.
 Or
 (b) Describe NOT gate giving its symbol, truth table and Boolean equation.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 600 words.

16. (a) Describe the characteristics of nuclear forces.

Or

- (b) List the properties of alpha, beta and gamma rays.

17. (a) Discuss the properties of para magnetic and diamagnetic materials.

Or

- (b) What is meant by super conductors? Give its applications.

18. (a) Explain the working of CO₂ laser.

Or

- (b) Describe the action of He-Ne laser.

19. (a) What is meant by Lorentz Fitzgerald length contraction? Explain.

Or

- (b) Derive expression for de Broglie's wave length of matter waves.

20. (a) How will you convert a binary number into hexadecimal number? Convert the binary 1000 1100 1010 1110 to its hexadecimal equivalent.

Or

- (b) Describe OR gate giving its symbol, truth table and Boolean equation.
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