(6 pages) **Reg. No. :** .....

Code No. : 40323 E **Sub. Code : JNPH 4 A**

U.G.(CBCS) DEGREE EXAMINATION,
NOVEMBER 2019.

Fourth Semester

Physics

Non Major Elective–BASIC PHYSICS-II

(For those who joined in July 2016 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer

1. Neutron and Proton together is usually called

(a) Nucleus (b) neutrino

(c) nucleon (d) nuclide

2. The size of the nucleus is of the order of

(a) $10^{-10}m$ (b) $10^{-9}m$

(c) $10^{-1}m$ (d) $10^{-15}m$

3. In a diamagnetic material, the susceptibility is

(a) Small and positive (b) Small and negative

(c) Large and positive (d) Large and negative

4. Amorphous materials are also called as

(a) Isotropic (b) anisotropic

(c) isomeric (d) none of the above

5. Meta stable states have

(a) Longer life time

(b) Shorter life time

(c) Two energy states merged together

(d) None of the above

6. The function of lithium in He-Ne laser is

(a) To increase the excitation of neon atom

(b) To increase the speed of neon atom

(c) To produce light

(d) None of the above

7. The theory of relativity was proposed by

(a) Einstein (b) Newton

(c) Raman (d) Heisenberg

8. A photon of frequency v has energy

(a) h/v (b) hv

(c) v (d) hv^2

9. The number of digits in a binary number system

(a) 8 (b) 6

(c) 10 (d) 2

10. The binary equivalent of the decimal (15) is

(a) 1001 (b) 1100

(c) 1111 (d) 1010

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) What are nuclear forces? Enumerate th characteristics of nuclear forces.

Or

(b) Define binding energy. Explain the bindin energy curve.

12. (a) What are diamagnetic materials? Give the properties also.

Or

(b) Differentiate the properties of conductors and insulators.

13. (a) What is laser? Explain the principle of laser.

Or

(b) Explain any two applications of laser.

14. (a) What are inertial and non-inertial frames.

Or

(b) State the basic postulates of special theory of relativity.

15. (a) Convert the following decimal into binary.

(i) 13 (ii) 37 (iii) 52

Or

(b) Explain the function of OR gate using diodes with neat sketch.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Derive the expression for Half life period and Mean life.

Or

(b) Enumerate the properties of α, β and γ particles.

17. (a) What are paramagnetic & ferromagnetic materials. Give their properties with example.

Or

(b) With neat sketch explain the properties of crystalline and amorphous materials.

18. (a) With neat sketch explain the construction of He-Ne laser and its working.

Or

(b) What is LASER? Give the basic principle of LASER and also explain population inversion.

19. (a) Explain length contraction & time dilation in relativity.

Or

(b) Give the postulates of quantum mechanics and explain De Broglie theory of matter waves.

20. (a) Add the following

(i) 1111+1101

(ii) 10011+10111

(iii) 111000 + 111101

(iv) 10101+10111

Or

(b) Explain 1's complement method of subtraction with examples.
