(6 pages)

Reg. No. : ....

Code No. : 41381 E   Sub. Code : SNPH 4 A

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

Fourth Semester

Physics

Non-Major Elective — BASIC PHYSICS — II

(For those who joined in July 2017 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The radius of the nucleus is of the order of _____ .

    (a) 1×10^{-15} m   (b) 1×10^{-9} m

    (c) 1×10^{-6} m   (d) 1×10^{-10} m

2. Alpha rays consist of _____ .

    (a) $_2He^3$ (b) $_2He^4$

    (c) $_1He^4$ (d) $_1He^3$

3. The example of amorphous material

    (a) glass   (b) plastic

    (c) diamond   (d) both (a), (b)

4. Super conductors have almost _____ resistivity.

    (a) zero   (b) high

    (c) low   (d) infinity

5. Communications are carried out by

    (a) electrical signals   (b) cables

    (c) wires   (d) (a) and (b)

6. The laser beam has high

    (a) direction   (b) coherence

    (c) intensity   (d) all of the above

7. De-broglie wavelength is given by

    (a) $\lambda = \dfrac{h}{mv}$ (b) $\lambda = \dfrac{m}{hv}$

    (c) $\lambda = \dfrac{v}{mh}$ (d) $\lambda = mhv$

8. Special theory of relativity was developed by

(a) Issac Newton

(b) Albert Einstein

(c) Heisenberg

(d) Max Planck

9. Decimal system has ———————— digits.

(a) 9   (b) 10

(c) 8   (d) 11

10. 1011 + 1101 is

(a) 11001   (b) 10001

(c) 11000   (d) 1000

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 general properties of nucleus.

Or

(b) What are the properties of nuclear forces?

12. (a) Write the properties of paramagnetic materials.

Or

(b) What are the uses of super conductor?

13. (a) Explain spontaneous and stimulated emission in laser.

Or

(b) Write the uses of communication.

14. (a) Derive an expression for De-Broglies wavelength for matter waves.

Or

(b) Explain about De-Broglie's concept.

15. (a) Write the four rules of Binary addition.

Or

(b) Describe the AND logic gate with circuit diagram and truth table.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) Define Binding energy. Explain the Binary energy curve.

Or

(b) Explain Nuclear fission.

17. (a) Discuss in detail about crystalline material.

Or

(b) Explain the properties of dia and ferro magnetic materials.

18. (a) Explain He-Ne Laser.

Or

(b) Explain the role of laser in science and technology.

19. (a) Explain length contraction and time dilation.

Or

(b) Explain Reference frames.

20. (a) Explain OR and NOT logic gates with circuit, truth table and working.

Or

(b) (i) Convert the binary 101.1101 into decimal.

(ii) Convert decimal 29 into binary.

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