(6 pages)

Reg. No. : .....

Code No. : 10437 E **Sub. Code : CAPH 21**

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

Second/Fourth Semester

Physics — Allied

ALLIED PHYSICS — II

(For those who joined in July 2021 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. If two resistors of values 20 ohm and 30 ohm are connected in series then their equivalent resistance is

   (a) 50 ohm

   (b) 1/50 ohm

   (c) -50 ohm

   (d) 0

2. The instrument used to measure potential difference between two points is

   (a) Ammeter (b) Voltmeter

   (c) Rheostat (d) Transformer

3. The force on the wire is at right angles to both the direction on the magnetic field and the direction of the current. This is discovered by

   (a) Faraday (b) Ampere

   (c) Fleming (d) Johns Burge

4. The change in number of magnetic field lines induces

   (a) current in coil

   (b) electromotive force (EMF) in the coil

   (c) frequency in coil

   (d) all of the above

5. In the breakdown region, a zener diode behaves like a ———— source.

   (a) constant voltage

   (b) constant current

   (c) constant resistance

   (d) none of the above

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6. Which gate is used to made IC decoders?

(a) NAND (b) NOR

(c) AND (d) None of the above

7. Nucleus is

(a) Positively charged

(b) Negatively charged

(c) Neutral

(d) Charge keeps on changing

8. Neutrons has the charge

(a) 1639 times of an electron

(b) 1739 times of an electron

(c) 1839 times of an electron

(d) 1939 times of an electron

9. What is the momentum of a body of 2 kg at its highest point, when thrown with a velocity of 15 m/s at an angle of 70° with the horizontal?

(a) 9.23 kg ms^{-1}

(b) 10.26 kg ms^{-1}

(c) 28.19 kg ms^{-1}

(d) None of the above

10. According to special theory of relativity which one is not an absolute quantity?

(a) time

(b) mass

(c) height

(d) both (a) and (b)

PART B — (5 × 5 = 25 marks)

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

11. (a) Define Ohm's law and explain it.

Or

(b) Write a short note on sensitivity of Wheatstone bridge.

12. (a) State and explain the Faraday's law of electromagnetic induction.

Or

(b) Give the properties of diamagnetic materials.

13. (a) What is zener diode? Explain the I-V characteristics of it.

Or

(b) Find 2's complement of binary number 10101110_2.

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14. (a) Write a note on Radioactivity.

Or

(b) Explain the properties of nuclear forces.

15. (a) Explain about the time of flight.

Or

(b) Write a note on length contraction.

PART C — (5 × 8 = 40 marks)

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

16. (a) Derive an expression for current density.

Or

(b) Describe abbut the conversion of galvanometer into an ammeter.

17. (a) Distinguish para and ferromagnetic materials.

Or

(b) Derive an expression for the mutual inductance of a coil using Ballistic Galvanometer.

18. (a) Describe the forward and reverse characteristics of junction diode.

Or

(b) What are the basis logic gates? Explain.

19. (a) Describe about the nuclear spin and nuclear magnetic dipole moment.

Or

(b) Explain the binding energy curve for nuclear.

20. (a) Describe about the greatest height attained by the projectiles.

Or

(b) Write down the Galiean transformation equation.

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