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Reg. No. : .....

Code No. : 10042 E      Sub. Code : SAPH 21/  
AAPH 21

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

Second/Fourth Semester

Physics — Allied

ALLIED PHYSICS — II

(For those who joined in July 2017–2020 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The material through which electric charge can easily flow is \_\_\_\_\_
- (a) Quartz              (b) Mica  
(c) Germanium        (d) Copper

2. If three  $2\Omega$  resistances are connected in series, the effective resistance will be
- (a) 0                      (b)  $6\Omega$   
(c)  $8\Omega$                 (d)  $2\Omega$
3. The relation connecting magnetic induction (B) and magnetic field intensity (H) is \_\_\_\_\_
- (a)  $\mu = B/H$             (b)  $\mu = BH$   
(c)  $\mu = H/B$             (d) none
4. The coefficient of mutual inductance between a pair of coils \_\_\_\_\_, if the number of turns is high.
- (a) high                  (b) small  
(c) 0                        (d) none
5. In the reverse bias of a diode, the resistance is \_\_\_\_\_
- (a) very high            (b) small  
(c) 0                        (d) none

6. The binary equivalent for the decimal number 7 is

- (a) 110 (b) 101  
(c) 111 (d) 001

7. Isotopes have \_\_\_\_\_ atomic number and \_\_\_\_\_ mass number.

- (a) different - same (b) same - different  
(c) same - same (d) even - odd

8. In the nuclear reaction  ${}_{92}\text{U}^{234} + X \rightarrow {}_{92}\text{U}^{235} + Y$ , X stands for

- (a) proton (b) electron  
(c) neutron (d) none

9. The horizontal distance covered by a projectile is large, if it is projected with an angle \_\_\_\_\_.

- (a)  $30^\circ$  (b)  $60^\circ$   
(c)  $45^\circ$  (d) none

10. The mass of the particle travelling with velocity of light will be \_\_\_\_\_.

- (a) 0 (b) infinity  
(c) 100 kg (d) none

PART B -- (5 × 5 = 25 marks)

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

11. (a) State and explain Ohm's law.

Or

(b) Explain the conversion of galvanometer into a volt meter

12. (a) What are diamagnetic materials? Give any three properties of them.

Or

(b) State and explain Lenz's law.

13. (a) Explain the V- I characteristics of junction diode.

Or

(b) Draw the symbol and truth table for a NOR gate.

14. (a) Define mass defect and binding energy.

Or

(b) What are the fundamental laws of radioactivity?

15. (a) Derive the expression for the horizontal range of a projectile.

Or

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

PART C — (5 × 8 = 40 marks)

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

16. (a) State and explain Krichoof's first and second laws.

Or

- (b) Derive the expression for the condition for bridge balance in a Wheatstone bridge.

17. (a) Obtain an expression for the self inductance of a long solenoid.

Or

- (b) Explain the determination of mutual inductance between a pair of coils using Ballistic Galvanometer.

18. (a) Explain the characteristics of Zener diode. How it is used as a voltage regulator?

Or

- (b) State and explain DeMorgan's theorems.

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19. (a) What are nuclear forces? Give their properties.

Or

- (b) State and explain Soddy - Fajan's displacement law.

20. (a) Prove that the path of the projectile is a parabola.

Or

- (b) Derive the Lorentz transformation equations.

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