M.CT.M CC HR.SEC.SCHOOL, KANADUKATHAN
SECOND MID TERM EXAMINATION-2021

CLASS: XII **PHYSICS** **MARKS: 50**

DATE: 23 .03.2021 **TIME: 1Hr30m**

PART-I

CHOOSE THE CORRECT ANSWER: **(5X1=5)**

1. The unit of permittivity is
   a) $C^2N^{-1}m^{-2}$ b) Nm^2C^{-2} c) Hm^{-1} d) $NC^{-2}m^{-2}$
2. If voltage applied on a capacitor is increased from V to 2V, choose the correct conclusion.
   a) Q remains the same, C is doubled b) Q is doubled, C doubled
   c) C remains same, Q doubled d) Both Q and C remain same
3. The nucleus is approximately spherical in shape. Then the surface area of nucleus having mass number A varies as
   a) $A^{2/3}$ b) $A^{4/3}$ c) $A^{1/3}$ d) $A^{5/3}$
4. If a half-wave rectified voltage is fed to a load resistor, which part of a cycle the load current will flow?
   a) 0^0-90^0 b) 90^0-180^0 c) 0^0-180^0 d) 0^0-360^0
5. The electrical series circuit in digital form is
   a) AND b) OR c) NOR d) NAND

PART- II

Note : Answer any three questions. **(3x2=6)**

6. State Coulomb's law.
7. What is corona discharge?
8. Define curie.
9. Prove the Boolean. Identify (A+B)(A+C)=A+BC
10. What do you mean by doping?

PART – III

Note : Answer any three questions. **(3x3=9)**

11. Write down the drawbacks of Bohr atom model.
12. State Boolean laws. Elucidate how they are used to simplify Boolean expressions with suitable example.
13. What are the differences between Coulomb force and gravitational force?
14. Derive the expression for resultant capacitance, when capacitors are connected in parallel.
15. Calculate the force between electron and proton in Hydrogen atom. ($e = 1.6 \times 10^{-9}$ and $r_o = 0.53$A)

PART- IV

Note: Answer any six questions. **(6X5=30)**

16. Calculate the electric field due to a dipole on its axial line.
17. Derive an expression for electrostatic potential due to an electric dipole.
18. Explain in detail the construction and working of a Van-de-Graaff generator.
19. Describe the working of nuclear reactor with a block diagram.
20. Obtain the law of radioactivity.
21. Explain the construction and working of a full wave rectifier.
22. State and prove De Morgan's First and Second theorems.

---------- *** All the best *** ----------