HTV

HALF YEARLY EXAMINATION - 2022

XII - Std

PHYSICS

Time: 3.00 Hrs

Marks : 70

PART - I

Note : 1. Answer all the questions. 2. Choose the most suitable answer from the given four alternatives and write the option code and the correcponding answer :- **15 x 1 = 15**

1. 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

2. The number of electric field lines crossing a given area Kept normal to the electric field lines is called .....
   a) Electric flux b) Magnetic flux c) Voltage d) Current

3. A toaster operating at 240V has a resistance of 120 Ω. Its power is
   a) 400W b) 2W c) 480W d) 240W

4. The vertical component of Earth's magnetic field at a place is equal to the horizontal component.What is the value of angled of dip at this place?
   a) 30^o b) 45^o c) 60^o d) 90^o

5. Lorent force is denoted by one of the following equation.
   a) $\vec{F} = q[\vec{V} \times \vec{B}]$ b) $\vec{F} = q[\vec{V} . \vec{B}]$ c) $\vec{F} = \vec{V}[q.B]$ d) $\vec{F} = q[\vec{B} \times \vec{V}]$

6. The a series resonant RLC circuitm, the voltage across 1000 resistor is 40V.The resonant frequency ω is 250 rad/s. If the value of C is 4 μ F, then the Voltage across L is
   a) 600V b) 4000V c) 400V d) 1V

7. If the potential difference is 10 X 10^3V and the electric power is 2 X 10^6W, then what is the value of a current?
   a) 200A b) 2000A c) 20A d) 100A

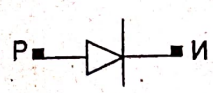
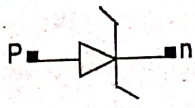
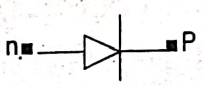
8. Which of the following electromagnetic radiations is used for viewing objects through fog
   a) Microwave b) Gamma rays c) X - rays d) Infrated

9. If the angle of prism is small of the order of ....., the prism is said to be a small angle prism.
   a) 40^o b) 10^o c) 50^o d) 30^o

10. the transverse nature of light is shown in,
    a) Interference b) Diffraction c) Scattering d) Polarisation

11. Emission of electrons by the absorption of heat energy is called ..... emission.
    a) Photoelectric b) Field c) Thermionic d) Secondary

12. The natural place where nuclear fusion occurs is the core of the stars, since their temperature is of the order of .....
    a) 10^4K b) 10^3K c) 10^7K d) 10^6K

13. Pick out the correct circuit symbol figure for the p – n junction diode.
    a) 
    b) 
    c) 
    d) 

14. The zener diode is primarily used as
a) Rectifier b) Amplifier c) Osillator d) Voltage regulator

15. Which one of the following is the natural nanomaterial
a) Peacock feather b) Peacock beak c) Grain of Sand d) Skil of the whale

PART - II

Answer any 6 questions :- (Question number 19 is compulsory) 6 X 2 = 12

16. What is corona discharge (or) action at points?
17. Distinguish between drift velocity and mobility.
18. State Kirchhoff's current rule.
19. Compate the current in the wire if a charge of 120C is flouring through a copper wire in 1 minute.
20. Mention the ways of producing induced emf.
21. Write down any two properities of electromagnetic waves.
22. Explain the reason for the glittering of diamond.
23. What are the conditions for obtaining clear and broad interference fringes?
24. Distinguish between intrinsic and extrinsic semiconductors.

PART - III

Answer any 6 questions. question number 26 is compulsory :- 6 x 3 = 18

25. Give the applications and disadvantages of capacitors.
26. Calculate the cut - off wavelength and cut-off frequency of x-rays from an x-rays tube of accelerating potential 20,000V.
27. How is an galvanometer converted into an ammeter?
28. How will you induce an emf by changing the area enclosed by the coil?
29. Derive the relation between f and R for a spherical mirror.
30. Derive an expression for De Broglie wavelength of electrons.
31. What are the properities of Cathode rays?
32. State De Morgan's first and second theoram.
33. Mention advantages and disadvantages of Robotics.

PART - IV

Answer all the following questions :- 5 X 5 = 25

34. Calculate the electric field due to a dipole on its axial line. ***(OR)***
Write the principle of cyclotron and discuss the working of cyclotron in detail.

35. Explain the equivalent resistance of a series and parallel resistor network? ***(OR)***
Explain the construction and working of a transformer.

36. Explain the types of emission spectrum. ***(OR)***
Derive the mirror equation and the equation for lateral magnification.

37. Explain the Young's double slit experimental setup and obtain the equation for path difference and define bandridth ***(OR)***
Obtain Einstein's photoelectric equation with necessary explanation.

38. Draw the circuit diagram of a half wave rectifier and explain its working. ***(OR)***
Explain the J.J. Thomson experimentto determine the specific charge of electron.