



**Avinashilingam Institute for Home Science and Higher Education for Women**  
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)  
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B  
Coimbatore - 641 043, Tamil Nadu, India

**Bachelor's Degree Examination – March 2021**  
**I Semester**

**Class : I UG**  
**Major : Chemistry**

**Time : 3 Hours**  
**Max. Marks: 100**

**18BCHI01 DSE- I Physics for Chemistry**

**Part A**  
**Choose the Correct Answer**

**10 x 1 = 10**

- In ballistic galvanometer, the frame on which the coil is wound is non-metallic. It is
  - to avoid the production of induced e.m.f
  - to avoid the production of eddy currents
  - to increase the production of eddy currents
  - to increase the production of induced e.m.f
- Interaction between the neighbouring dipoles is negligible in the case of a
  - diamagnetic material
  - paramagnetic material
  - antiferromagnetic material
  - ferromagnetic material
- A pn junction that radiates energy as light instead of heat is called a
  - LED
  - Photodiode
  - Photocell
  - Zener diode
- The inputs of NAND gate are connected together. The resulting circuit is \_\_\_\_\_.
  - OR gate
  - AND gate
  - NOT gate
  - EX-OR gate
- The minimum value of frequency of incident light below which no photoelectric emission is possible, is known as
  - visible frequency
  - invisible frequency
  - threshold frequency
  - ultraviolet frequency
- X-rays behave as
  - particle only
  - wave only
  - wave as well as particle
  - cathode's rays
- Due to high coherence of laser beam, it can be used in
  - diffraction
  - interference
  - polarisation
  - grating
- The shorter wavelength lines are known as
  - Stokes lines
  - Anti-stokes lines
  - Exciting lines
  - Rayleigh lines
- An endoscope is an instrument for examining
  - a body cavity
  - the cancer cells
  - blood flow rates
  - the head surfaces
- The use of superconducting magnets in MRI is to obtain
  - signals from surface tissues
  - high R.F. field
  - high strength gradient fields
  - high strength magnetic field

**Part B**

**5 x 6 = 30**

**Answer ALL questions**

**Each answer should not exceed 400 words or two pages**

- 11.a. Mention the necessary conditions for a Ballistic galvanometer.  
(or)
- 11.b. What are Paramagnetic materials? Give their properties and applications.
- 12.a. Explain n-type semiconductor, with a neat diagram.  
(or)
- 12.b. Express NAND gate as a universal gate.
- 13.a. State the laws of Photoelectric emission. Derive Einstein's photoelectric equation.  
(or)
- 13.b. Discuss characteristic X-ray spectrum. Show it on an energy level diagram.
- 14.a. Describe the construction and working of a Ruby laser.  
(or)
- 14.b. Brief the elementary theory of Raman effect.
- 15.a. Draw the typical electrocardiogram and explain its different parts.  
(or)
- 15.b. Describe the ultrasonic imaging system (M-mode) with a suitable diagram.

**Part C**

**5 x 12 = 60**

**Answer ALL questions**

**Each answer should not exceed 800 words or four pages**

- 16.a. Elaborate how the charge sensitiveness can be determined for a Ballistic galvanometer.  
(or)
- 16.b. Distinguish the types of magnetic materials and discuss their uses.
- 17.a. Explain the V-I characteristics of Zener diode and its uses.  
(or)
- 17.b. Discuss AND, OR, NOT, NAND and NOR gates with logic symbol and truth table.
- 18.a. Discuss Millikan's experimental verification of Einstein's photoelectric equation. How will you determine Planck's constant, threshold frequency and work function of a metal?  
(or)
- 18.b. Describe various types of Photocells and give an account on their uses.
- 19.a. Derive the Einstein's coefficients. Obtain a relation between transition probabilities of spontaneous and stimulated emissions.  
(or)
- 19.b. Explain the construction and working of Laser Raman Spectrometer.
- 20.a. What are the uses of endoscopes in medicine? Describe any one of the therapeutic instruments using an endoscope.  
(or)
- 20.b. Draw the block diagram of an MRI system and explain the image reconstruction using it.

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