VIVEKANANDA COLLEGE, ALIPURDUAR

B.sc 2nd Semester-2022

PHYSICS DSC(P) F.M: 10

Internal assessment

Answer the following questions:

Number distributions: 3 + 2 + 2 + 3 = 10

1. A piece of iron of dimension 5 cm x 2 cm x 1cm and magnetic moment of each atom 16 x 10^{-24} Am^2. At the state of saturated induced moment, find the magnetic moment of the iron piece. Given, atomic mass of iron= 56 and density= 7.8gm/cc
2. A system has two charges, q_A = 2.5 x 10^{-7} C and q_B = - 2.5 x 10^{-7} C are located at points A(0,0,-15) and B(0,0,15). Calculate the dipole moment and also describe its direction.
3. Two wires A and B have the same length equal to 44cm and carry a current of 10 Amp. A is bent into a circle and B is bent into a square.
   (a) Obtain the magnitudes of the fields at the centers of the wires.
   (b) Which wire produces a greater magnetic field at the center?
4. State the Faraday's law. Discuss the physical significance of Faraday's law.

VIVEKANANDA COLLEGE, ALIPURDUAR

B.sc 4th Semester-2022

PHYSICS DSC(P) F.M: 10

Internal assessment

Answer the following questions. (Each question carries 5 marks)

1. (i) Given the equations of two sound wave are

   $Y_1 = 0.2 \sin \frac{2\pi}{3} (330t - x)$ m

   $Y_2 = 0.2 \sin \frac{2\pi}{3+k} (330t - x)$ m

   If 10 beats produced per time, then find the value of k.

   (ii) For plane wave, show that energy density is proportional to the normal frequency.

2. (i) Discuss the conditions for maxima and minima in case of Fraunhofer diffraction of light at a single slit.

   (ii) How many orders would be visible, if the wavelength of incident light is 589nm and the number of lines in the grating is 106 per nm.

VIVEKANANDA COLLEGE, ALIPURDUAR

B.SC 4TH SEMESTER - 2022

PHYSICS SEC (P) F.M : 10

Internal Assessment

Answer the following questions. (Each question carries 2 marks)

1. What is renewable energy ? Give an example of non-conventional energy sources. (1+1)

2. Write a short note on biomass.

3. Discuss about the importance of solar energy.

4. Write a short note on Osmotic power.

5. Discuss about the importance of tide energy.

VIVEKANANDA COLLEGE, ALIPURDUAR

B.sc 6th Semester-2022

PHYSICS DSE(P) F.M: 10

Internal assessment

Each question carries 2 marks

1. What are Miller indices? In a cubic unit cell, find the angle betweer normal to the planes (101) and (112)
2. Obtain Bragg's law from Laue's law.
3. Two dimensional lattice has the basis vectors

   $\vec{a} = 2\,\hat{x}$, $\vec{b} = \hat{x} + 2\hat{y}$

   Find the reciprocal lattice vectors.
4. Explain the dispersion relation for linear diatomic lattice.
5. Deduce Curie's law.