Sabarmati University

(Formerly, Calorx Teachers' University)

Internal Exam / Questions Bank / Assignments

Note:

Internal assessment in the terms of midterm examination will be replaced by assignment evaluation, i.e., the students will be scored out of 30 marks for their assignments so write the very clear and full answer. Please submit paper wise assignment in **supplementary**. Last date for the submission is **30/04/2021.**

Name of Course: B.Sc. (Sem.-1)

Code & Name of Paper: PHY-101, Physics

Max. Marks: 30

Part-A: (I) Answer the following questions. (Any three)

1. State the Gauss's theorem and write the equation.
2. What is piezoelectric effect?
3. Give the fullform of LASER and uses.
4. Write the cyclic property of triple scaler product of three vectors.
5. Write the unit of Capacitor, Inductance, Resistor, Current and Voltage, emf.
6. Draw the LCR circuit.

Part-B: Answer the following questions. (Any four)

1. (i) if $\vec{A} = \hat{\imath} + 2\hat{\jmath} + 3\hat{k}$, $\vec{B} = \hat{\imath} - 3\hat{\jmath} + 4\hat{k}$, $\vec{C} = 2\hat{\imath} + 4\hat{\jmath} - 2\hat{k}$. Calculate $\vec{A}X(\vec{B}X\vec{C})$ and $\vec{B}X(\vec{C}X\vec{A})$.

2. Derive the differential eqation for longitudinal wave propagating through rod and show that its velocity is $V=\sqrt{\frac{E}{\delta}}$.

3. Calculate the inductance of the coil in the grid circuit of an oscillator to produce ultrasonic wave frequency 10^6 Hz in a piezoelectric method. Capacitance=0.025 pF.

4. The diameter of 8th ring in Newton's ring experiment is 100 mm. Refractive index of liquid is 1.3 and it is used in place of air, what would be the diameter of the same ring?

5. Find energy diffrence in **eV** between upper and lower lasing level of laser emitting radation of 9.6 μm.

6. Give the diffrence between music and noise.

Part-C: Answer the following questions. (Any three)

1. Explain physical significance of divergence. Show that divergence of a vector $\vec{A}(x, y, z)$ at point $(x, y, z)$is,

$$\nabla \cdot \vec{A} = \frac{\partial Ax}{\partial x} + \frac{\partial By}{\partial y} + \frac{\partial Az}{\partial z}$$

2. Discribe the method to determine speed of ultrasonic sound in liquid with necessary diagram.

3. Obtain relation between object distance D_1, image distance D_2 and system matrix element for paraxial optics. Hence, derive the expression for magnification.
4. With reference to laser, derive the relation between Einstein co-efficeint.
5. State and explain Fermat's principle.
6. Explain diffrentiation of vector $\left[\frac{d\vec{A}}{dt}\right]$ in two diemnsional polar co-ordinate system with necessary eqautions.

----------All The Best----------