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**CARMEL COLLEGE OF ARTS, SCIENCE & COMMERCE FOR WOMEN,  
NUVEM-GOA  
SEMESTER END EXAMINATION, NOVEMBER 2022**

**Semester: I**

**Basic Physics PYG 101**

**Total marks: 80   Date: 30/11/2022   Duration: 2 Hours   Total No of pages: 02**

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**Instructions:**

- 1) All questions are compulsory, however internal choice is available.
- 2) Figures to the right indicate maximum marks to the question.
- 3) Symbols have their usual meanings unless otherwise stated.
- 4) Draw neat diagram wherever necessary.
- 5) Use of non-programmable calculator is permitted.

**Q1. Answer any four of the following.**

**4x4 = 16 marks**

- a) With the help of a neat diagram, discuss the working of a transformer.
- b) Discuss some applications of capillarity.
- c) With the help of a neat diagram, explain how the Kundt's tube is used to detect ultrasonic waves.
- d) State Lenz's Law. If we move a bar magnet's north pole towards a loop held perpendicular to the bar magnet, what is the direction of the current induced in the loop. Explain.
- e) What are filter circuits? Explain the working of a choke input filter with the help of a neat diagram.
- f) State Coulomb's law of electrostatics. Write the SI unit of permittivity. Explain the effect of medium on the magnitude of the force between two charges.

**Q2. Answer any four of the following.**

**4x4 = 16 marks**

- a) Define parallax. With the help of a suitable diagram, describe the parallax method of measuring the distance between the earth and a faraway planet.
- b) State and explain any four factors on which the intensity of sound depends on.
- c) With the help of a neat diagram, discuss the concept of pressure energy.
- d) Discuss any two applications of ultrasonic waves.
- e) Define resistance. Write the expression for resistance and define the parameters involved. How can we distinguish between a good conductor and an insulator in terms of the resistivity?
- f) State Hooke's law. Discuss the different types of elasticity.

**Q3. (A)**

(p) Define magnetic field and mention its SI units. Write the expression for the magnitude of the magnetic force on a charged particle. (3)

(q) Define induced emf and electromagnetic induction. How do the poles of a magnetic dipole exert forces on other magnetic poles? (3)

**OR**

**Q3. (A)**



(y) Mention the device used to measure masses of atomic or sub-atomic particles. State Newton's law of gravitation and define the parameters involved. (3)

**Q3. (B)**

Discuss Zener diode characteristics and its use as a voltage regulator. (6)

**Q4. (A)**

(p) Write and explain any three general performance characteristics of a transducer. (3)

(q) Discuss any three applications of electrostatics. (3)

**OR**

**Q4. (A)**

(x) Define rectification efficiency. What are the disadvantages of using a centre-tap full-wave rectifier? (3)

(y) What are voltage sources and current sources. Draw the I-V characteristics for a voltage source and a current source. (3)

**Q4. (B)**

Draw a neat diagram and calculate the apparent frequency when the source is at rest and the listener is moving away from the source. (6)

**Q5. (A)**

(p) Define inductance and mention its SI units. Write the expression for the inductance of a cylindrical inductor and define the parameters involved. (3)

(q) Write a note on Light Emitting Diodes. (3)

**OR**

**Q5. (A)**

(x) State Bernoulli's theorem. State the use of a Pitot tube. (3)

(y) Draw a neat diagram of an open-tube Manometer and explain how it is used to measure pressure. (3)

**Q5. (B)**

With the help of a neat diagram, explain the construction and working of a Galton whistle. (6)

**Q6. (A)**

(p) State the three types of behaviors that are observed while dealing with the angle of contact. (3)

(q) Define viscosity. State the use of an Ostwald viscometer? (3)

**OR**

**Q6. (A)**

(x) Define Ohm's law and explain the limiting cases. (3)

(y) Discuss the different methods of charging. (3)

**Q6. (B)**

Discuss the Volt-Ampere characteristics of a junction diode. (6)