SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc. Physics - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER - II

**22UPHCT2003 - Acoustics And Thermodynamics**

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

## Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Explain: Free and Forced Vibrations by giving an example for each.
2. Illustrate the applications of ultrasonic waves in SONAR.
3. State and explain Third law of thermodynamics.
4. Derive the expression for intensity of sound.
5. Classify the difference between Diesel and Petrol Engine.
6. Predict the application of Ultrasonic waves in the Non-Destructive Testing (NDT) of the materials.
7. State and explain the first law of thermodynamics.
8. (i) Distinguish between Loudness and Intensity of sound.
   (ii) Show that a 26% change in intensity alters the sound level by 1 dB.

## Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Explain damped Oscillations and discuss analytically the motion of a particle executing damped simple harmonic oscillations.
10. A heat engine working between two temperatures could theoretically convert one eighth of the heat supplied into work. If the lower temperature is reduced by $95^{\circ}$ C, the theoretical efficiency would be doubled. Find the initial temperatures.
11. Discuss in detail about the production of ultrasonic waves and examine their applications in the field of Medicine.
12. Apply the first law of thermodynamics to the isothermal and adiabatic process and explain it in brief with necessary diagrams.
13. Apply the Fourier's theorem to analyse a Square wave into its harmonic components.

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