

(4)

13. What is meant by Stationary or Standing Wave ? Explain how stationary wave develops.
14. What is reverberation time ? How does this affect the audibility in a room ? How can it be altered from one value to another ?

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Ex/B.Sc/PHY/12/90/2019(OLD)

BACHELOR OF SCIENCE EXAMINATION, 2019

(1st Year, 2nd Semester)

PHYSICS (HONOURS)

Paper : HO - 3

Time : Two hours

Full Marks : 50
(25 for each group)

Use separate answer script for each group.

GROUP - A (25 marks)

Answer *q.no. 1* and any *three* from the rest.

- What is Thermodynamic equilibrium ?
 - State and explain the first law of thermodynamics.
 - An ideal gas (1 mole) expands adiabatically from volume V_i to volume V_f at constant temperature. Find out its work done.
 - What do you mean by “entropy” of a system ?
 $2^{1/2} \times 4 = 10$
- Define C_p and C_v . Show that for ideal gas $C_p - C_v = R$.
[The symbols have their usual meanings]. $2+3$
- Two engines A and B are working simultaneously according to the following figure. If the work done by A and by B are same, find out the temperature T. 5

(Turn Over)

(2)



4. Derive Maxwell's 2nd and 4th Thermodynamic relations by using Jacobian method. 5
5. (a) A thermal engineer develops an engine working between 327°C and 27°C and claims to have an efficiency of 52%. Does he claim correctly?
(b) 40 gm of ice melts to water at 0°C , find out the change in entropy.
[The latent heat of ice to water is 80 cal/gm] 3+2
6. State and prove Wien's displacement law of radiation. 5

(3)

GROUP - B (25 marks)

Answer any *five* questions.

All questions carry equal marks

7. Explain the following terms
(a) Low damping
(b) Over damping
(c) Critical damping
8. Write down the differential equation for forced vibration, explaining how it is obtained.
9. What is resonance? Distinguished between amplitude resonance and velocity resonance.
10. What is a beat? Explain the basic conditions for formation of beats.
11. What is Doppler effect? Derive an expression for the change in frequency when source is in motion and the observer is at rest.
12. What is longitudinal wave? Write down the wave equation and explain how it propagates.

(Turn Over)