Time: 3 Hours

D(1)PH(1)SUB

Full Marks: 75

समय –तीन घंटा

अधिकतम अंक–75

2019

Instruction

Candidates are required to give their answers in their own words as for as practicable. Answer any six questions, selecting at least one question from each group.

Group – A

1. What do you understand by time-dilation? Describe an experiment to verify time-dilation.

2. Establish mathematically Einstein's mass-energy relationship. Explain physical significance of this relation.

Group – B

3. Explain 'generalised coordinates', generalised velocities and generalized momenta.

4. Describe, with theory, an experiment to determine the surface tension of a liquid at different temperatures.

Group – C

5. What do you mean by Fourier series? Evaluate Fourier coefficients.

6. What is reverberation? Explain how it becomes the main cause of acoustical defect of auditoriums.

7. What do you mean by free and damped oscillations in one dimension? Describe forced oscillator with one degree of freedom.

Group – D

8. Derive Van der Waal's equation of state and discuss how far this equation is keeping with experimental results? https://www.brabuonline.com

9. What is transport phenomenon? Explain the phenomenon of conduction by gases and obtain expression for conductivity on the basis of kinetic theory of gases.

Group – E

10. Prove Carnot's theorem. Establish the thermodynamic scale of temperature.

11. Deduce Rayleigh-Jeans law for black-body radiations. Clearly stating the assumptions made. Is this theory complete?

12. Establish Maxwell's thermodynamic equations.