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Printed Pages : 4

Degree (Part-I) Examination, 2020

(Subsidiary/General)

PHYSICS

[Paper : First]

[PPU-D-I(SUB/GEN)-PHY]

Time : Three Hours

[Maximum Marks : 75

33

Note : Candidates are required to give their answers in their own words as far as practicable. Attempt **any six** questions in all selecting three from Group-A, one from Group-B and two from Group-C.

Group - A

1. Stating the basic postulates of special theory of relativity, obtain Lorentz space-time coordinate transformation relations.
2. Show that $y = 3K(1 - 2\sigma)$ where y is Young's modulus, K bulk modulus and σ Poisson's ratio.

1205-01/17620

(1)

[P.T.O.]

3. Explain the terms : streamlined flow, turbulent flow, critical velocity and Reynold's number.
4. Define surface tension and show its relationship with surface energy.
5. What do you understand by angle of twist and angle of shear ? In twisting of a cylindrical rod, show that the shear is maximum on the surface.



Derive Poiseuille's formula for the rate of flow of a liquid through a capillary of uniform bore. Mention the assumptions made and discuss the corrections you have to employ.

Group - B

7. Derive and solve the equation of forced vibrations. Discuss the term 'Sharpness of resonance'.
8. What are Ultrasonic Waves ? Give one method of their generation.

Group - C

9. State the second law of thermodynamics and explain its physical significance. Derive an expression for the efficiency of a reversible Carnot's engine.

1205-01/17620

(2)

10. Show that entropy always increases for an irreversible process.
11. Express the Van der Waal's equation in terms of reduced parameters P_r , V_r and T_r . List the limitations of Van der Waal's equation.
12. What is Joule-Thomson effect ? Obtain an expression for Joule-Thomson coefficient for a real gas.

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