

International Islamic University Chittagong (IIUC)

Department of Electronic and Telecommunication Engineering

Final Examination

Program: B.Sc. (Engg.)
Course Code: PHY -1101
Full Marks: 50

Semester: Spring - 2018
Course Title: Physics-I
Time: 2 hours 30 minutes

Group- A

[Answer *any two* sets of the following questions]

1. (a) What do you understand by surface energy? Explain with an example. 02
(b) "Surface tension of a liquid is equal to the free energy of the liquid surface", Justify the statement. 06
(c) Write a short note on: Angle of contact. 02
2. (a) Prepare a short note on streamline motion with appropriate figure. 03
(b) State and prove the equation of continuity of the flow of fluids through a pipeline. 05
(c) An incompressible liquid of density 1120 Kg/m^3 is flowing through a pipeline with velocity 220 cm/s . Estimate the value of dynamic pressure inside the pipeline. 02
3. (a) State Bernoulli's theorem with an appropriate figure. 02
(b) Derive the equation for terminal velocity of a freely falling body through a viscous liquid using Stoke's theorem. 06
(c) A fluid of density 1000 Kg/m^3 is flowing through a narrow pipeline of inner radius 2 cm . If the value of coefficient of viscosity of the fluid is 120 , determine the value of critical velocity. 02

Group- B

[Answer *any three* sets of the following questions]

4. (a) Write down the criteria for Simple Harmonic Motion. 02
(b) " $x = A \sin(\omega t + \delta)$ is a solution to differential equation of SHM", Justify the statement. 06
(c) A particle in S.H.M is oscillating with amplitude 2 mm . If the energy of the particle is 8 Joule , determine the force constant of the medium. 02
5. (a) Propose a short note on thermodynamic system. 02
(b) "The internal energy of an isolated system is constant", Justify the statement. 05
(c) State and explain the zeroth law of thermodynamics. 03
6. (a) Explain Carnot cycle for 1 gm molecule of working gas. 08
(b) An engine is working between 120°C and 30°C . Calculate its efficiency. 02
7. (a) What is polarization of light? 02
(b) How can we produce plane polarized light? Explain any one procedure. 05
(c) Explain Brewster's law with appropriate figure. 03