

International Islamic University Chittagong (IIUC)

Department of Electronic and Telecommunications Engineering

Final Examination

Program: B.Sc. (Engg)
Course Code: PHY-1101
Time: 2 hour 30 minutes

Semester: Spring 2019
Course Title: Physics-I
Full Marks: 50

[Group A]

[Answer any two sets of questions]

- [1] (a) What is cohesive and adhesive force? 2
(b) Find the relation between surface tension and surface energy. 5
(c) Calculate the work done in spraying a spherical drop of mercury of radius 10^{-3} m into a million drops of equal size. Surface tension of mercury is 550×10^{-3} N/m. 3
- [2] (a) Explain the terms stream line flow and turbulent flow of fluid. 2
(b) What is equation of continuity? Deduce equation of continuity. 5
(c) Calculate the speed at which the velocity head of a stream of water is equal to 0.50m of Hg. 3
- [3] (a) Define the terms: Capillarity, Angle of contact. 3
(b) State Bernoulli's theorem and show that for a liquid in stream line motion, the summation of pressure head, gravitational head and velocity head is constant. 7

[Group B]

[Answer any three sets of questions]

- [4] (a) What is the difference between transverse wave and longitudinal wave? 2
(b) Derive an expression for the stationary wave. Also find the condition for nodes and antinodes. 5
(c) Determine the angular frequency and initial phase of the simple harmonic motion described by the equation, 3
$$y = 10 \sin(t + \delta)$$

In which time period is 30s and displacement is 0.05 m initially.
- [5] (a) Explain damped and forced oscillation. 3
(b) Explain Doppler's effect for stationary source and moving observer. 4

- (c) A whistling train approaching towards platform with a velocity of 90 kmh^{-1} . If the frequency of the whistle is 600 Hz and velocity of sound is 325 ms^{-1} then what will be the apparent of the sound to an observer standing at the platform. 3
- [6] (a) What do you mean by interference of light? 2
 (b) Explain Young's double slit experiment for interference of light to produce bright and dark fringes. 5
 (c) The straight and narrow parallel slits of 1 mm apart are illuminated by monochromatic light. Fringes formed on the screen held at a distance of 1 m from the slits are 0.50 mm apart. Calculate the wavelength of light used. 3
- [7] (a) State second law of thermodynamics. 2
 (b) Explain Carnot's cycle of thermodynamics. 5
 (c) Find the efficiency of the carnot's engine working between steam point and ice point. 3