

International Islamic University Chittagong (IIUC)

Department of Electronic and Telecommunications Engineering

Final Examination

Program: B.Sc. (Engg.)
Course Code: PHY -1201
Full Marks: 50

Semester: Autumn-2018
Course Title: Physics – II
Time: 2 hours and 30 minutes

Group- A

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

1. (a) What do you understand by 'equation of continuity' for current? Explain. 02
(b) Derive an expression for current passing through an R-C circuit during charging of the capacitor. 06
(c) A $6\mu F$ capacitor is first charged and then discharged through a $2 M\Omega$ resistor. 02
Calculate the time for voltage to drop by one third of its initial value.
2. (a) State and explain Ohm's Law. 02
(b) What is alternating current? Prove that $I = I_0 \sin\omega t$ where the symbols have their usual meaning. 05
(c) Determine the average value of alternating current for half cycle. 03
3. (a) What do you understand by primitive unit cell? Explain with example. 02
(b) Critically describe fcc lattice with appropriate figure and examples. 05
(c) Show that, bcc lattice is much closely packed than sc lattice. 03

Group- B

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

4. (a) Write the equations of Lorentz transformation equations. 02
(b) Attain the equation for relativistic equation for time. 06
(c) A stick of length 2m is moving with a velocity $2.5 \times 10^{08} \text{ ms}^{-1}$. Calculate its relativistic length. 02
5. (a) Write a short note on nuclear binding energy. 02
(b) Describe Bohr atomic model for Hydrogen atom to calculate energy of the electron. 06
(c) Calculate the binding energy of a deuterium atom. 02
6. (a) Propose your idea about x-rays and its properties. 05
(b) Describe production of x-ray by Coolidge tube. 05
7. (a) State and explain radioactive decay law. 02
(b) Deduce the expression, $N = N_0 e^{-\lambda t}$, where the symbols have their usual meaning. 05
(c) The half life of Cs is 30 years. A sample of Cs has an activity of $5.8 \times 10^5 \text{ Bq}$. After 03
how long time will the activity fall to $1.6 \times 10^4 \text{ Bq}$.