



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম
International Islamic University Chittagong
Faculty of Science and Engineering (FSE)
Department of Civil Engineering (CE)

END-OF-SEMESTER EXAMINATION
SEMESTER AUTUMN-2022 SESSION

Programme	: Bachelor of Science in Civil Engineering	Level of Study	: Example: UG 1 .
Time	: 9:30am~12:00	Date	: December 18, 2022 Sunday
Duration	: 2hour 30 Minutes		
Course Code	: PHY-1205	Section(s)	: 2AM
Course Title	: Physics-II (Structure of matter, Electricity and Magnetism, Modern and Quantum Physics)		

This Question Paper Consists of **TWO (2)** Printed Pages (Including Cover Page and Appendix) with **FIVE (5)** Questions.

Course Learning Outcome(CLO)	
CLO-1	Understanding the information about the structure of the matter;
CLO-2	Remembering the various equation about the problem solution;
CLO-3	Investigate and team work about the complex engineering problems and design systems
CLO-4	Apply the knowledge to solve the engineering problems

Bloom's Levels of the Questions						
Letter Symbol	R	U	A	ANA	E	C
	Remember (10)	Understand (10)	Apply (10)	Analysis (30)	Evaluation (30)	Create (10)

INSTRUCTION(S) TO CANDIDATES

DO NOT OPEN UNTIL YOU ARE ASKED TO DO SO

- This is a Closed Book, Closed Notes Examination.
- Do not open until You Are Asked to Do So.
- Total mark of this examination is 100 for two sections A & B and is worth 50% of the total course.
- Attempt All Questions.
- Mobile Phones and Other Electronic Devices are Prohibited in the Exam Hall.
- **Workout Can Be Done Using Pencil Or Pen.**

Note: Any form of cheating or attempt to cheat is a serious offence, which may lead to dismissal

PART –A

(There are THREE questions, answer all THREE Questions)

QUESTION 1 (20 marks)

- a) Explain physical significance of ohm's law. (4 marks)
- b) A resistance R and $2\mu\text{F}$ capacitor in series are connected to a 200 volt direct supply. Across the capacitor is a neon lamp that strikes at 120 volts. Calculate the value of R to make the lamp strike 5 seconds after switch has been closed. (6 marks)
- c) Obtain an expression for the growth and decay of charge in capacitor through a resistance. (10 marks)

QUESTION 2 (20 marks)

- a) Explain the terms magnetic field and magnetic flux. (4 marks)
- b) i) Discuss magnetic flux. (10 marks)
- ii) Using Biot –savert law, calculate the value of magnetic field due to an infinitely long straight wire carrying a current i amp at a distance a from the wire.
- c) A solenoid of 1200 turns is wound uniformly in a single layer on a glass tube 2m long and 0.2 m in diameter. Calculate the magnetic induction at the centre of the solenoid, when the current of 2A flows through it. (6 marks)

QUESTION 3 (20 marks)

- a) Define inductor, capacitor. (4 marks)
- b) Draw the LC circuit and build up the relation between the inductor and capacitor (10 marks)
- c) A positive charge of $q_1=2\times 10^{-7}\text{C}$ is placed at a distance of 0.15m from another positive charge of $q_2=8\times 10^{-7}\text{C}$. At what point on the line joining them is the electric field zero? (6 marks)

PART –B

(There are TWO questions, answer all TWO Questions)

QUESTION 4 (20 marks)

- a) Explain the postulates of special theory of relativity. (4 marks)
- b) Define Galilean transformation and write Lorentz transformation equation. (4 marks)
- c) The particle of mass 10^{-30} kg is moving with a speed of $2.8 \times 10^8 \text{ m/s}$. Calculate its mass when it is motion. (6 marks)
- d) The length of a spaceship is measured to be exactly half its actual length. Calculate (i) the speed of the spaceship and (ii) the time dilation corresponding to one second on the spaceship. (6 marks)

QUESTION 5 (20 marks)

- a) Compare the nuclear fission and fusion. (4 marks)
- b) The half-life of radon is 5 years, calculate decay constant and mean life of radon? (6 marks)
- c) Determine the radius of the first orbit of the hydrogen atom. (10marks)

End of Questions Paper