International Islamic University Chittagong

Department of Electrical and Electronic Engineering

B. Sc. Engineering in EEE

Final Exam, Autumn 2022

Course Code: **PHY-1201** Course Title: **Physics II**

Time: 2 hours 30 minutes Full Marks: 50

(i) The figures in the right-hand margin indicate full marks

(ii) Course Outcomes and Bloom's Levels are mentioned in additional Columns

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Course Outcomes (COs) of the Questions	
CO1	Identify the basic knowledge of different areas of physics as well as engineering aspect.
CO2	Design solution for physics problems that meet the specified needs for public health and safety, societal and environmental concerns.

Bloom's Levels of the Questions						
Letter Symbols	**R**	**U**	**App**	**An**	**E**	**C**
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

Part A

[Answer the questions from the followings]

1.	a)	Explain the terms the resistance and specific resistance. **Justify** the statement- "the average value of electromotive force for half cycle is E_{mean}=0.693 E_0".	**CO1, CO1**	**U + E**	**2+5**
1.	b)	A capacitor is charged by DC supply through a resistance of 20 mega ohm. If it takes 0.6 sec for the charge to reach three quarters of its final value, what is the capacitance of the capacitor?	**CO2**	**App**	**3**
2.	a)	State and explain different types of bond in solid .Calculate the dimensions of unit cell for face centerd cubic lattice .	**CO1, CO2**	**U+ App**	3+4
2.	b)	In a simple cubic crystal , Determine the ratio of intercepts on the three axes by (123) plane .	**CO2**	**App**	**3**

Or,

2.	a)	Compare between potential difference and electromotive force. Deduce an expression for the emf induced in a coil rotating in a uniform magnetic field and draw the induced emf curve and write the current equation.	**CO1, CO1**	**U+ U**	3+4
2.	b)	A capacitor of capacitance 0.3 μF is first charged and then discharged through a resistance of 20 mega ohm. Find the time, the potential will take to fall to half its original value.	**CO2**	**App**	**3**

Part B

[Answer the questions from the followings]

3.	a)	What do you understand of length contraction? "The length of moving objects is smaller than the length of rest object" Justify it.	**CO1**	**U +E**	**1+5**
3.	b)	The length of a rocket on the ground is 100 m. When the rocket moves with respect to a stationary observer on the ground, its length appears to be 99.5m. Calculate the speed of the rocket?	**CO2**	**App**	**4**
4.	a)	Define De-Broglie waves? Discuss the spectral series of hydrogen atom.	CO1	R+U	2+5
4.	b)	Calculate the energy required to excite the hydrogen atom form the ground state (n=1) to the first excited state (n=2).	CO2	App	3
5.	a)	Compare the nuclear fission and fusion. Justify the statement "the number of radioactive atoms decreases exponentially with time".	**CO1**	**U + E**	**2+5**
5.	b)	The half-life of radon is 50 days, calculate decay constant and mean life of radon?	**CO2**	**App**	**3**

Or,

5.	a)	Explain the postulates of special theory of relativity? Prove the Einstein mass energy relation.	**CO1**	**U + E**	**2+5**
5.	b)	The particle of mass 10^{-24} kg is moving with a speed of $1.8 \times 10^8 m/s$. Calculate its mass, when it is in motion.	**CO2**	**App**	**3**