বাংলাদেশ আর্মি ইন্টারন্যাশনাল ইউনিভার্সিটি অব সায়েন্স অ্যাণ্ড টেকনোলজি (বিএআইইউএসটি) কুমিল্লা
Bangladesh Army International University of Science and Technology (BAIUST) Comilla

Term Final Examination, FALL 2020
SET-A
(For EVEN Stu. ID Only)

Department of Computer Science and Engineering
Level-1, Term-II
Course Code: PHY 103
Course Title: Physics

Time : 1 hr. 20 mins.
Full Marks : 40

Notes:

a. Figure on the right of each question indicate marks for respective question.

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1. Explanation (Answer any Two) 02 x 05 = 10

a. Explain the formation of Newton's rings with figure.
b. "In case of electromagnetic induction, induced electromotive force obeys the law of conservation of energy"- explain the statement.
c. Explain how Nicol prism acts as both polarizer and analyzer with figures.

2. Short Question/Importance (Answer any One) 01 x 03 = 03

a. What are the packing factor and the coordination number of FCC and BCC crystal structures?
b. Discuss the importance of defects in solids.

3. Drawing/Differentiation (Answer any Three) 03 x 04 = 12

a. Draw crystal planes for Miller indices (201) and $(00\bar{1})$ separately.
b. Draw schematic diagram of Laurent's half shade polarimeter and label various components of it.
c. Draw band diagram for conductor and semiconductor, then label different energy bands in the diagram.
d. Write down the differences between crystal structure and crystal system.

4. Mathematical Problems (Answer any Three) 03 x 05 = 15

a. X-rays of wavelength 3.6 Å are diffracted in second order at an angle of 28^0 in Bragg's crystal spectrometer. Find the effective spacing of atomic layers in the crystal.
b. The electromotive force of an electric cell is 5 V and its internal resistance is 0.5Ω. Parallel combination of two resistors of 3 Ω and 6 Ω is connected to the cell. Calculate the current flowing through each resistor.
c. What is the highest order spectrum, which may be seen with monochromatic light of wavelength 5890 Å by means of a diffraction grating with 5905 lines per cm.?
d. A proton is moving with velocity of $2x10^5$ ms^{-1} making angle of 60^0 with a uniform magnetic field. If the acting force on proton is $4.8x10^{-15}$ N, calculate the magnitude of that magnetic field.