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# Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

**Mid-Term Examination, Summer–2026**

Course Code: 0533-111 | Course Title: Physics

Section: A, B, C, D, E, F | Level-Term: L1-T1 | by- TanviR

Full Marks: 25 | Exam Date: 1 July 2026 | Time: 1.5 Hours

*Note: There are three sets of questions in total. Answer all of them. Right hand margin indicates full marks.*

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|---|---|---|---|
| **Q1.** | (a) **Explain** coherent source. | **CO-1 (C2)** | [2] |
| | (b) State the Zeroth law of thermodynamics and **describe** it. | **CO-1 (C2)** | [2] |
| **Q2.** | (a) **Express** the relation between pressure and volume of a gas in adiabatic process. | **CO-2 (C2)** | [4] |
| | (b) **Show** that the change of entropy in an irreversible process is positive. | **CO-2 (C2)** | [2] |
| | (b) **Estimate** the phase difference of the interfering light waves at a point x units away from the center of the screen in Young's double-slit experiment. | **CO-2 (C3)** | [3] |
| **Q3.** | (a) Two moles of a diatomic ideal gas ($\gamma = 1.40$) is compressed adiabatically from an initial state of $T_1 = 350$ K, $V_1 = 10.0$ L to a final volume $V_2 = 4.0$ L. **Calculate** the final temperature $T_2$ and the work done on the gas in joules. | **CO-2 (C3)** | [3] |
| | (b) In Newton's ring experiment, a lens with R = 1.15 m is placed on a flat plate. The diameter of the $13^{th}$ bright ring is 7.40 mm. **Calculate** the wavelength and the radius of the $9^{th}$ dark ring? | **CO-2 (C3)** | [3] |
| | (c) Interference fringes are produced at a distance of 1.23 m away by two slits situated 0.075 cm apart from each other. The $6^{th}$ bright fringe is obtained 12 mm away from the central maxima. **Calculate** the wavelength of light. | **CO-2 (C3)** | [3] |
| | (d) If 2.5 kg of ice at -7°C is transferred into vapour of 100°C, **calculate** the change in entropy. ( $S_{ice} = 2.1$ kJkg$^{-1}$K$^{-1}$; $S_w = 4.2$ kJkg$^{-1}$K$^{-1}$ ; $L_f = 334$ kJkg$^{-1}$; $L_v = 2260$ kJkg$^{-1}$) | **CO-2 (C3)** | [3] |