



Daffodil International University
Department of Electrical and Electronic Engineering
Faculty of Engineering
Mid-Term Examination, Summer-2026

Course Code: 0533-111
Section: A, B, C, D, E, F
Full Marks: 25

Course Title: Physics
Level-Term: L1-T1
Exam Date: 1 July 2026

Teacher's Initial: SAT, MMR
Time: 1.5 Hours

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

Q1. (a) Explain coherent source.

CO-1 [2]
(C2)

(b) State the Zeroth law of thermodynamics and **describe** it.

CO-1 [2]
(C2)

Q2. (a) Express the relation between pressure and volume of a gas in adiabatic process.

CO-2 [4]
(C2)

(b) **Show** that the change of entropy in an irreversible process is positive.

CO-2 [2]
(C2)

(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 [3]
(C3)

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 [3]
(C3)

(b) In Newton's ring experiment, a lens with $R = 1.15$ m is placed on a flat plate. The diameter of the 13th bright ring is 7.40 mm. Calculate the wavelength and the radius of the 9th dark ring?

CO-2 [3]
(C3)

(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 6th bright fringe is obtained 12 mm away from the central maxima. Calculate the wavelength of light.

CO-2 [3]
(C3)

(d) If 2.5 kg of ice at -7°C is transferred into vapour of 100°C , calculate the change in entropy. ($S_{\text{ice}} = 2.1 \text{ kJkg}^{-1}\text{K}^{-1}$; $S_{\text{w}} = 4.2 \text{ kJkg}^{-1}\text{K}^{-1}$; $L_f = 334 \text{ kJkg}^{-1}$; $L_v = 2260 \text{ kJkg}^{-1}$)

CO-2 [3]
(C3)

$$TV^{\gamma-1}$$

$$(T_2)$$

$$x_n = \frac{n\lambda D}{d}$$

$$W = \frac{nR}{\gamma-1} (T_2 - T_1)$$