

## Part A: Sound wave in a closed tube (3.7 points)

**A.1** (0.3 pt)

$$\lambda_{\max} =$$

**A.2** (0.5 pt)

$$V_1(x) =$$

**A.3** (0.7 pt)

$$p_1(x) =$$

**A.4** (0.3 pt)

$$c =$$

**A.5** (0.7 pt)

$$T_1(x) =$$

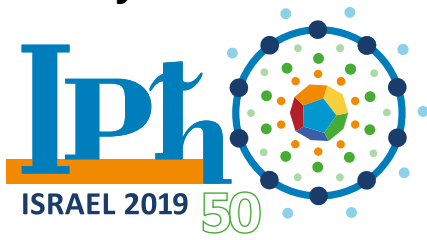
**A.6** (1.2 pt)

point	increase	decrease	same
A			
B			
C			

## Part B: Sound wave amplification induced by external thermal contact (6.3 points)

**B.1** (0.4 pt)

$$T_{\text{st}} =$$



**B.2** (1.0 pt)

$$\tau_{\text{cr}} =$$

**B.3** (0.8 pt)

$$\frac{dQ}{dt} =$$

**B.4** (1.9 pt)

$$V_a =$$

$$V_b =$$

**B.5** (0.8 pt)

$$W_{\text{tot}} =$$

**B.6** (0.8 pt)

$$Q_{\text{tot}} =$$

**B.7** (0.6 pt)

$$\eta =$$