

L2-PHYSR



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## Level 2 Physics, 2019

9.30 a.m. Friday 8 November 2019

### RESOURCE SHEET for 91170, 91171, and 91173

Refer to this sheet to answer the questions in your Question and Answer Booklets.

Check that this sheet is printed on the back.

**YOU MAY KEEP THIS SHEET AT THE END OF THE EXAMINATION.**

You may find the following formulae useful.

**91170 Demonstrate understanding of waves**

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i} \quad \text{or} \quad s_i s_o = f^2$$

$$m = \frac{d_i}{d_o} = \frac{h_i}{h_o} \quad \text{or} \quad m = \frac{f}{s_o} = \frac{s_i}{f}$$

$$n_1 \sin \theta_1 = n_2 \sin \theta_2 \quad \frac{n_1}{n_2} = \frac{v_2}{v_1} = \frac{\lambda_2}{\lambda_1}$$

$$v = f\lambda \quad f = \frac{1}{T} \quad v = \frac{d}{t}$$

Speed of light in a vacuum =  $3.00 \times 10^8 \text{ m s}^{-1}$

**91171 Demonstrate understanding of mechanics**

$$v = \frac{\Delta d}{\Delta t} \quad a = \frac{\Delta v}{\Delta t} \quad v_f = v_i + at$$

$$d = v_i t + \frac{1}{2} at^2 \quad d = \frac{v_i + v_f}{2} t \quad v_f^2 = v_i^2 + 2ad$$

$$a_c = \frac{v^2}{r}$$

$$F = ma \quad \tau = Fd \quad F = -kx$$

$$F_c = \frac{mv^2}{r} \quad p = mv \quad \Delta p = F\Delta t$$

$$E_p = \frac{1}{2} kx^2 \quad E_k = \frac{1}{2} mv^2 \quad \Delta E_p = mg\Delta h$$

$$W = Fd \quad P = \frac{W}{t}$$

where needed, use  $g = 9.8 \text{ m s}^{-2}$

**91173 Demonstrate understanding of electricity and electromagnetism**

$$E = \frac{V}{d} \quad F = Eq \quad \Delta E_p = Eqd$$

$$E_k = \frac{1}{2} mv^2$$

$$I = \frac{q}{t} \quad V = \frac{\Delta E}{q} \quad V = IR$$

$$P = IV \quad P = \frac{\Delta E}{t}$$

$$R_T = R_1 + R_2 + \dots \quad \frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$$

$$F = BIL \quad F = Bqv \quad V = BvL$$

Charge on an electron =  $-1.60 \times 10^{-19} \text{ C}$

Mass of an electron =  $9.11 \times 10^{-31} \text{ kg}$