L2–PHYSMR

992608

NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

**QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!**

Ahupūngao, Kaupae 2, 2021

PUKAPUKA RAUEMI
mō 91170M, 91171M, 91173M

Tirohia tēnei pukapuka hei whakatutuki i ngā tūmahi o ō Pukapuka Tūmahi, Tuhinga hoki.

Tirohia mēnā e tika ana te raupapatanga o ngā whārangi 2−3 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

KA TAEA TĒNEI PUKAPUKA TE PUPURI HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

Tērā pea ka whai hua ēnei tikanga tātai ki a koe.

91170M Te whakaatu māramatanga ki te ngaru

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i}$$

$$s_i s_o = f^2 \text{ rānei}$$

$$m = \frac{d_i}{d_o} = \frac{h_i}{h_o}$$

$$m = \frac{f}{s_o} = \frac{s_i}{f} \text{ rānei}$$

$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$

$$\frac{n_1}{n_2} = \frac{v_2}{v_1} = \frac{\lambda_2}{\lambda_1}$$

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

Tere o te aho i rō korekore = 3.00×10^8 m s^{-1}

91171M Te whakaatu māramatanga ki te pūhanga manawa

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

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

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

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

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

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

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

ina hiahiatia, whakamahia te $g = 9.8$ m s^{-2}

91173M Te whakaatu māramatanga ki te hiko me te autōhiko

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

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

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

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

$$R_T = R_1 + R_2 + ... \qquad \frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + ...$$

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

Whana hiko ki te irahiko = -1.60×10^{-19} C

Papatipu o te irahiko = 9.11×10^{-31} kg

You may find the following formulae useful.

91170 Demonstrate understanding of waves

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

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

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

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

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

91171 Demonstrate understanding of mechanics

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

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

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

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

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

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

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

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

91173 Demonstrate understanding of electricity and electromagnetism

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

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

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

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

$$R_T = R_1 + R_2 + \ldots \qquad \frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$$

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

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

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

English translation of the wording on the front cover

Level 2 Physics, 2021

RESOURCE BOOKLET
for 91170M, 91171M, and 91173M

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

Check that this booklet has pages 2–3 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.