The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING PHYSICS

Wednesday, June 17, 2015 — 1:15 to 4:15 p.m., only

ANSWER BOOKLET

☐ Male

Student ..... Sex: ☐ Female

Teacher .....

School ..... Grade .....

Record your answers for Part B–2 and Part C in this booklet.

Part B–2

51–52

$P = ?$

$1.3 \times 10^4\ N = F$

$v = 1.5\ m/s$

$P = Fv$

$= (1.3 \times 10^4\ N)(1.5\ m/s)$

$= 19500\ W$

51 +1

52 +1

53–54 $\lambda = 2 \times 10^{-2}\ m$

$f = ?$

$v = f\lambda$

$f = \frac{v}{\lambda} = \frac{3 \times 10^{8}\ m/s}{2 \times 10^{-2}\ m}$ } 53 +1

$1.5 \times 10^{10}\ Hz$ } 54 +1

55–56

$E = ?$

$m_{proton} = 1.67 \times 10^{-27}\ kg$

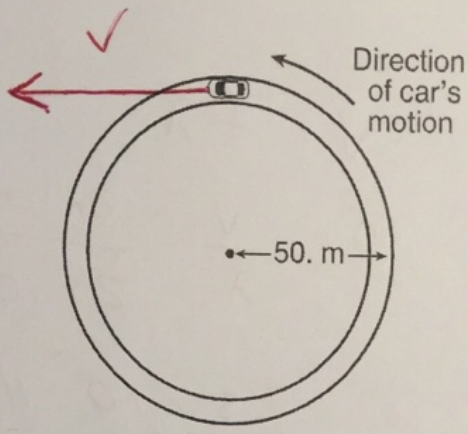
$E = mc^2$

$(1.67 \times 10^{-27}\ kg)(3 \times 10^{8}\ m/s)^2$ } 55 +1

$1.5 \times 10^{-10}\ J$ } 56 +1

57

+1



Track, as Viewed from Above

58–59

$A_c = ?$

$m = 1.5 \times 10^3 \text{ kg}$

$v = 12 \text{ m/s}$

$r = 50 \text{ m}$

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

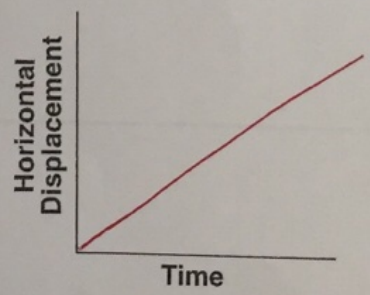
$$A_c = \frac{(12 \text{ m/s})^2}{50 \text{ m}}$$

$$A_c = 2.88 \text{ m/s}^2$$

50 +1

55 +1

60



61–62 $t = ?$

$V_{i,y} = 7.5\ m/s$

$a_y = -9.81\ m/s^2$

$V_{fy} = 0\ m/s$

$V_f = V_i + at$

$t = \dfrac{V_f - V_i}{a}$

$\dfrac{-7.5\ m/s}{-9.81\ m/s^2}$

$.765\ s \times 2$

$1.53\ s$ } 62 (+1)

61 (+1)

63 $56 \pm 2°$. (+1)

64–65

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

$n_1 \sin 30° = 1 \sin 56°$

$n_1 = \dfrac{\sin 56°}{\sin 30°}$

$n_1 = 1.66$ } 65 (+1)

64 (+1)

+1

Part C

66 1.962 N

$W = mg$
$= (.2\,kg)(9.81\,m/s^2)$
$1.962\,N$

67–68

$f_K = \mu_K F_N$

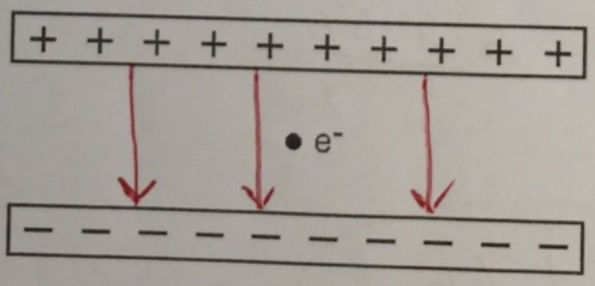
$= (.36)(1.962\,N) = .706\,N$ } 67 (+1) } 68 (+1)

4N RIGHT
.706N LEFT

69 3.29 N

70 VELOCITY WILL INCREASE

71



72 TOWARD POSITIVE PLATE

73–74

$$E = \frac{F_e}{q} = \frac{3.8 \times 10^{-16}\ N}{1.6 \times 10^{-19}\ C} \Big\} 73 \quad (+1)$$

$$2375\ N/C \Big\} 74 \quad (+1)$$

75 FORCE REMAINS CONSTANT (+1)

76 F

77 4.896×10^{-19} J

$$-5.74\ eV + 3.06\ eV = -2.68\ eV$$

$$3.06\ eV \times \frac{1.6 \times 10^{-19}\ J}{1\ eV}$$

78–79

$E_{ph} = 3.06\ eV = 4.896 \times 10^{-19}\ J$

$f = ?$

$$E = hf$$

$$f = \frac{E}{h} = \frac{4.896 \times 10^{-19}\ \cancel{J}}{6.63 \times 10^{-34}\ \cancel{J} \cdot s} \Big\} 78 \quad (+1)$$

$$7.38 \times 10^{14}\ Hz \Big\} 79 \quad +1$$

80 VIOLET LIGHT
VISIBLE LIGHT

81–82 $R = ?$

$P = 40\,W$

$V = 120\,V$

$$P = \frac{V^2}{R}$$

$$R = \frac{V^2}{P} = \frac{(120\,V)^2}{40\,W}$$

$R = 360\,\Omega$ } 82 +1

} 81 (+1)

83 NO CHANGE

84 EQUIVALENT RESISTANCE WOULD INCREASE

85 THE EQUIVALENT RESISTANCE OF THE SERIES CIRCUIT WOULD BE GREATER