Tear Here

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING
PHYSICS

ANSWER SHEET

Student ..... WPE Key ..... Sex: ☐ Male ☐ Female Grade .....

Teacher ..... School .....

Record your answers to Part A and Part B–1 on this answer sheet.

Part A

1	2	13	3
2	3	14	3
3	3	15	4
4	2	16	2
5	4	17	4
6	4		
7	1		
8	3		
9	3		
10	4		
11	3		
12	4		

Part A Score ☐

Part B–1

18	1	30	3
19	4	31	1
20	1	32	3
21	3	33	2
22	3	34	3
23	1	35	1
24	2		
25	3		
26	3		
27	4		
28	3		
29	4		

Part B–1 Score ☐

Write your answers to Part B–2 and Part C in your answer booklet.

The declaration below should be signed when you have completed the examination.

I do hereby affirm, at the close of this examination, that I had no unlawful knowledge of the questions or answers prior to the examination and that I have neither given nor received assistance in answering any of the questions during the examination.

Signature

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REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING
PHYSICS

ANSWER BOOKLET

Student ..... Sex: ☐ Male ☐ Female

Teacher .....

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

Answer all questions in Part B–2 and Part C. Record your answers in this booklet.

Part	Maximum Score	Student's Score
A	17	
B–1	18	
B–2	15	
C	24	

Total Written Test Score (Maximum Raw Score: 74) ☐

Final Score (From Conversion Chart) ☐

Raters' Initials:

Rater 1 ..... **Rater 2** .....

Part B–2

For Raters Only

36 8.1 ± .2 m ☐

37-38

G: F = 50N, d = 8.1m, t = 3s

U: P

$P = \frac{Fd}{t}$ $P = \frac{(50N)(8.1m)}{3s}$

$P = 135W$ ☐ ☐

39 20 N/m slope = $k = \frac{F}{x} = \frac{8N}{.4m}$ ☐

40-41

G: K = 20 N/m, x = .3m

U: PE_s

$PE_s = \frac{1}{2}Kx^2$

$PE_s = \frac{1}{2}(20N/m)(.3m)^2$

$PE_s = .9J$ ☐ ☐

42-43

G: m = 3.34×10^{-27} kg, v = 2.89×10^5 m/s

U: KE

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

$KE = \frac{1}{2}(3.34 \times 10^{-27}kg)(2.89 \times 10^5 m/s)$

$KE = 1.39 \times 10^{-16}J$ ☐ ☐

For Raters Only

44 ☐

45 ☐

46 ☐

47 ☐

48 ☐

49 ☐

50 ☐

44-45

G: $F_s = 3N$, $x = .6m$

U: k

$F_s = kx \Rightarrow k = \frac{F_s}{x}$

$k = \frac{3N}{.6m}$

$\boxed{k = 5\,N/m}$

46

Some of the energy gets converted into internal energy (heat - Q)

47-48

G: $F = 1.3 \times 10^4 N$, $v = 1.5\,m/s$

U: P

$P = Fv$

$P = (1.3 \times 10^4 N)(1.5\,\frac{m}{s})$

$\boxed{P = 19500W \text{ or } 1.95 \times 10^4 W}$

49-50

G: $F_g = 490N$, $d = 2m$, $t = 10s$

U: P

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

$P = \frac{(490N)(2m)}{10s}$

$\boxed{P = 98W}$

Part C

51-52 G

$m = 325\,kg$

$h = 20m$

$g = 9.81 \frac{m}{s^2}$

U

PE_g

$PE_g = mgh$

$PE_g = (325kg)(9.81 \frac{m}{s^2})(20m)$

$\boxed{PE_g = 63765\,J}$

49 ☐

50 ☐

53-54 G

$PE_i = KE_f = 63765\,J$

$m = 325\,kg$

U

$v = ?$

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

$63765J = \frac{1}{2}(325kg)v^2$

$\sqrt{v^2} = \sqrt{392.4}$

$\boxed{v = 19.81 \frac{m}{s}}$

53 ☐

54 ☐

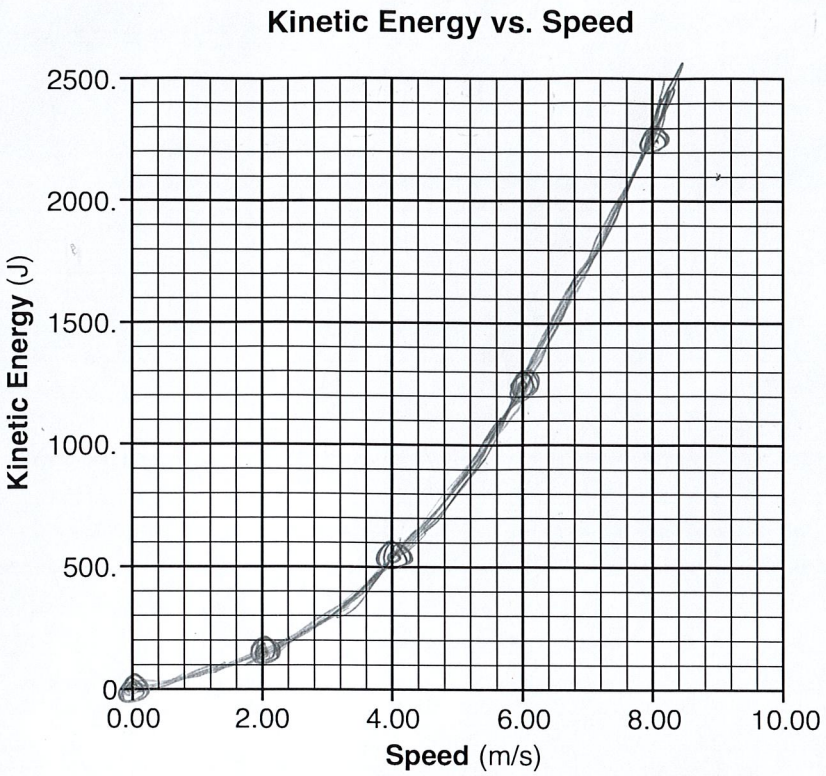
55 Total mechanical energy is the same

55 ☐

56 ☐

57 ☐

56-57



58 ☐

59 ☐

58-59

G

$KE = 2240J$

$v = 8\frac{m}{s}$

U

m

$KE = \frac{1}{2}mv^2 \Rightarrow m = \frac{2KE}{v^2}$

$m = \frac{2(2240J)}{(8\frac{m}{s})^2}$

$\boxed{m = 70Kg}$

60 The kinetic energy of soccer player is less than the runner

60 ☐

For Raters Only

61 ☐

62 ☐

63 ☐

64 ☐

61-62

G

$K = 150\ N/m$

$m = 2\ kg$

$g = 9.81\ \frac{m}{s^2}$

U

① x

② F_s

① $F_s = kx \Rightarrow x = \frac{F_s}{k}$

② $F_s = F_g = mg$

$F_s = (2kg)(9.81\ \frac{m}{s^2})$

$F_s = 19.62\ N$

$x = \frac{19.62\ N}{150\ N/m}$

$\boxed{x = .1308\ m}$

63-64

G

$K = 150\ N/m$

$x = .1308\ m$

U

PE_s

$PE_s = \frac{1}{2} k x^2$

$PE_s = \frac{1}{2}(150\ N/m)(.1308\ m)^2$

$\boxed{PE_s = 1.28\ J}$

65-66

G
$m = 3kg$
$g = 9.81 \frac{m}{s^2}$
$h = 3m$

U
PE_g

$PE_g = mgh$
$PE_g = (3kg)(9.81 \frac{m}{s^2})(3m)$
$\boxed{PE_g = 88.29\ J}$

65 ☐
66 ☐

67-68

G
$E_T = 88.29\ J$
$m = 3kg$
$g = 9.81 \frac{m}{s^2}$
$h = 1m$

U
KE

$E_T = PE_g + KE$
$E_T = mgh + KE$
$88.29J = (3kg)(9.81 \frac{m}{s^2})(1m) + KE$
$\boxed{KE = 58.86J}$

67 ☐
68 ☐

69 G

69 ☐

70 182.4 J $W = Fd = (30.4N)(6m)$

70 ☐

71 ☐

71-72

G
$F_g = 40N$
$h = 3m$

U
PE_g

$PE_g = mgh$
$PE_g = (40N)(3m)$
$\boxed{PE_g = 120J}$

72 ☐

73 Kinetic Energy remains the same

73 ☐

74 Internal Energy increases

74 ☐