ADVANCED PLACEMENT PHYSICS B EQUATIONS DEVELOPED FOR 2012

FLUID MECHANICS AND THERMAL PHYSICS

44. $\rho = m/V$

45. $P = P_0 + \rho g h$

46. $F_{buoy} = \rho V g$

47. $A_1 v_1 = A_2 v_2$

48. $P + \rho g y + \frac{1}{2}\rho v^2 = \text{const.}$

49. $\Delta \ell = \alpha \ell_0 \Delta T$

50. $H = \frac{kA\Delta T}{L}$

51. $P = \frac{F}{A}$

52. $PV = nRT = Nk_BT$

53. $K_{avg} = \frac{3}{2}k_BT$

54. $v_{rms} = \sqrt{\frac{3RT}{M}} = \sqrt{\frac{3k_BT}{\mu}}$

55. $W = -P\Delta V$

56. $\Delta U = Q + W$

57. $e = \left|\frac{W}{Q_H}\right|$

58. $e_c = \frac{T_H - T_C}{T_H}$

A = area
e = efficiency
F = force
h = depth
H = rate of heat transfer
k = thermal conductivity
K_{avg} = average molecular kinetic energy
ℓ = length
L = thickness
m = mass
M = molar mass
n = number of moles
N = number of molecules
P = pressure
Q = heat transferred to a system
T = temperature
U = internal energy
V = volume
v = velocity or speed
v_{rms} = root-mean-square velocity
W = work done on a system
y = height
α = coefficient of linear expansion
μ = mass of molecule
ρ = density

ATOMIC AND NUCLEAR PHYSICS

59. $E = hf = pc$

60. $K_{max} = hf - \phi$ = eΔV_s

61. $\lambda = \frac{h}{p}$

62. $\Delta E = (\Delta m)c^2$

E = energy
f = frequency
K = kinetic energy
m = mass
p = momentum
λ = wavelength
ϕ = work function

WAVES AND OPTICS

63. $v = f\lambda$

64. $n = \frac{c}{v}$

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

66. $\sin\theta_c = \frac{n_2}{n_1}$

67. $\frac{1}{s_i} + \frac{1}{s_0} = \frac{1}{f}$

68. $M = \frac{h_i}{h_0} = -\frac{s_i}{s_0}$

69. $f = \frac{R}{2}$

70. $d\sin\theta = m\lambda$

71. $x_m \approx \frac{m\lambda L}{d}$

d = separation
f = frequency or focal length
h = height
L = distance
M = magnification
m = an integer
n = index of refraction
R = radius of curvature
s = distance
v = speed
x = position
λ = wavelength
θ = angle

GEOMETRY AND TRIGONOMETRY

Rectangle
$A = bh$

Triangle
$A = \frac{1}{2}bh$

Circle
$A = \pi r^2$
$C = 2\pi r$

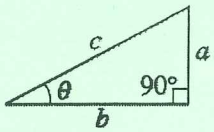
Rectangular Solid
$V = \ell wh$

Cylinder
$V = \pi r^2 \ell$
$S = 2\pi r\ell + 2\pi r^2$

Sphere
$V = \frac{4}{3}\pi r^3$
$S = 4\pi r^2$

A = area
C = circumference
V = volume
S = surface area
b = base
h = height
ℓ = length
w = width
r = radius

Right Triangle
$a^2 + b^2 = c^2$
$\sin\theta = \frac{a}{c}$
$\cos\theta = \frac{b}{c}$
$\tan\theta = \frac{a}{b}$



Conceptual Q. (65, 16) 5 PTS.

Chap 27 9-14; 27-32 Problems 10 PTS

mc 23, 4, 9, 1, 1 5PTS