Answer on Question #53047, Physics / Other

Task:

1.A room of 1.5 litres contains gas with pressure 10^5 Pa.If the gas particle has average speed of 750 m/s,then gas mass that trapped in the room is...gram

A.0.8

B.0.7

C.0.6

D.0.5

E.0.4

Answer: A.0.8

$m=3pV/u^2=3*1.5*10^{-3}*10^5/(750^2)=0.0008kg=0.8gram$

2.An object is placed 375 mm in front of a concave mirror with focus 250 mm. If the object is moved 25 mm away from the mirror, then it's shadow will shift to...mm

A.80

B.82

C.83

D.84

E.85

Answer: C.83

Focus f=250mm, V_1=375mm, V_2=400mm, V_1 and V_2 are objects distance

$(1/U_1)+(1/V_1)=1/f$, where U_1 is image distance.

So $1/U_1=(1/f)-(1/V_1)=(1/250)-(1/375)=(1/750)$, U_1=750mm

So $1/U_2=(1/f)-(1/V_2)=(1/250)-(1/400)=(3/2000)$, U_2=2000/3 mm

then it's shadow will shift to $U_1- U_2$ =700-2000/3=83.3 mm

3.If purple light frequency of 10^16 Hz falls on a metal surface with verge energy 1/3 of energy quanta of the purple light. The kinetic energy of the released electron is...X 10^-18J

A.6.6

B.4.4

C.3.3

D.2.2

E.1.1

Answer: D.2.2

The kinetic energy of the electron will be equal to 1/3 of the energy of a quantum of the light.

According to the Planck–Einstein relation, the energy of the light is hv, where h is Planck's constant and v is the frequency of the light. So...

$E = 6.626 \times 10^{-34}\ m^2\ kg / s * (1/3) * 10^{16} / s = 2.20 * 10^{-18}\ m^2\ kg / s2$
So assuming the numbers are in Joules, the answer is D, 2.2