Shagaf

Physics
Final

Done By:
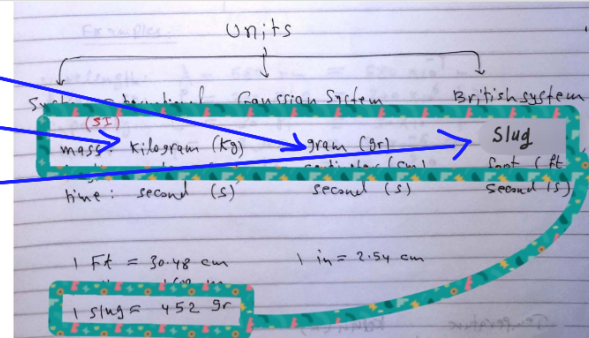
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Designed By :

Raneem Dmour

1.)Which of the following is a unit of force?
A.Gram.
B.Kg.
C.Pound.
D.Slug.

هذول كلام
للكتلة

Answer"C.Pound"

2.)A nucleus is denoted by $^5X^{12}$, How many Protons?
A.12
B.5
C.7
D.17

$$^{12}_{5}X \qquad ^{A}_{Z}X \qquad Z = 5 \Rightarrow protons$$

$$A = 12$$

Answer"B.5"

3.)The radius of water pipe decrease from 0.2 m to 0.1 m.
If the average velocity in wider portion is 5m/s,
find the average velocity in the narrower portion
A.24m/s.
B.12m/s.
C.16m/s.
D.20m/s.

$$Q_1 = Q_2 \qquad\qquad 0.04(5) = 0.01 V_2$$

$$A_1 V_1 = A_2 V_2 \qquad V_2 = \frac{0.04}{0.01}(5)$$

$$\cancel{\pi} r_1^2 V_1 = \cancel{\pi} r_2^2 V_2 \qquad = 4(5) = 20\,m/s$$

$$0.2^2(5) = 0.1^2 V_2$$

Answer"D.20m/s"

4.)A child throws a ball so that it rises 5m while travelling 7m
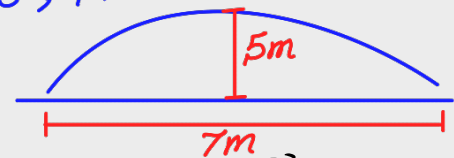**horizontally in 2s and then begins to drop.What is the magnitude of the**
initial velocity?
A.13.94 m/s.
B.11.06 m/s.
C.10.5 m/s.
D.12.98 m/s.

$$V_{xi} = V_{xf} \Rightarrow V_{xf} = \frac{\Delta x}{\Delta t} = \frac{7}{2} = 3.5\,m/s\,,\,+x$$

$$V_{yf}^2 = V_{yi}^2 - 2g\Delta y$$

$$0 = V_{yi}^2 - 2(9.8)5$$

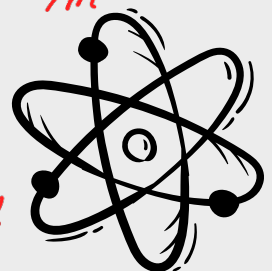$$V_{yi}^2 = 98 \Rightarrow V_{yi} = \sqrt{98} = 9.9\,m/s\,,\,+y$$

Answer"C.10.5 m/s"

5m

7m

$$V_i = \sqrt{V_{xi} + V_{yi}}$$
$$= \sqrt{3.5^2 + 9.9^2}$$
$$= \sqrt{110.25} = 10.5\,m/s$$

$V_{yf} = 0$

لأنه الجسم تكون سرعته العمودية
صفرًا حينما يصل إلى أقصى
ارتفاع

5.)If A=8X+Y & B=4X+Y !What is the magnitude of the resultant?

A.12.85.

B.14.40.

C.16.19.

D.12.16.

$$A = 8\hat{i} + \hat{j} \quad , \quad B = 4\hat{i} + \hat{j}$$

$$A + B = 8\hat{i} + \hat{j} + 4\hat{i} + \hat{j}$$

$$= 12\hat{i} + 2\hat{j} \qquad = 12.165$$

$$\text{resultant} = \sqrt{(12)^2 + 2^2}$$

$$= \sqrt{144 + 4} = \sqrt{148}$$

Answer"D.12.16"

6.)A parachutist of weight w strikes the ground and moved up with a=5g , find the force exerted by the ground on him

A.6w.

B.7w.

C.4w.

D.5w.

$$F = (\Sigma a)m \qquad \text{When } (g \cdot m) = W$$

$$F = (a + g)m \qquad So \approx> F = 6(g \cdot m)$$

$$F = (5g + g)m \qquad = 6 W$$

$$F = 6gm$$

Answer"A.6w"

7.)The average flow rate of blood in the aorta is 6.2×10⁻⁶ m³/s and it has a radius of 1.3×10⁻²m , the viscosity of blood is (2.084×10⁻³ pa.s), The average blood velocity is?

A.13.6×10⁻³.

B.7.9×10⁻³.

C.9.8×10⁻³.

D.11.7×10⁻³.

$$\overline{V} = \frac{Q}{A} \qquad \frac{6.2 \times 10^{-6}}{\pi (1.3 \times 10^{-2})^2}$$

$$= \frac{6.2 \times 10^{-6}}{1.69 \times 10^{6} \, \pi} = 1.167 \times 10^{-2} = 11.67 \times 10^{-3} \, m/s$$

Answer"D.11.7×10⁻³"

8.)From the information of problem 7 , What is the flow resistance per 3m long?

A.5.58×10⁵.

B.7.44×10⁵.

C.1.86×10⁵.

D.3.72×10⁵.

$$R_f = \frac{8\eta l}{\pi R^4}$$

$$= \frac{8(2.084 \times 10^{-3}) \times 3}{(1.3 \times 10^{-2})^4 \, \pi}$$

Answer"A.5.58×10⁵"

$$= \frac{50 \times 10^{-3}}{8.97 \times 10^{-8}} = 5.57 \times 10^{5}$$
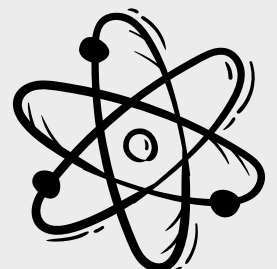
9.) A man of 83 kg climbes a hill of height 7 m in 4 minutes, What is the power delivered by him?

A. 4233.6.

B. 43200

C. 1162

D. 1423.5

$W = Fd$

$W = mad$

$= 83 \times 9.8 \times 7$

$P = \dfrac{W}{\Delta t} = \dfrac{5693.8}{4}$

$= 1423.45$

Answer"D. 1423.5"

10.) A concave lens of a focal length 20 cm , If an object is placed at a distance of 50 cm from the lens. Find the distance of image.

A.(-12) cm.

B.33.3 cm.

C.(-14.3) cm.

D.15 cm.

$\dfrac{1}{-f} = \dfrac{1}{S} + \dfrac{1}{S'} \approx \dfrac{-1}{20} = \dfrac{1}{50} + \dfrac{1}{S'}$

$\dfrac{-1}{20} - \dfrac{1}{50} = \dfrac{1}{S'}$

$\dfrac{-5}{100} - \dfrac{2}{100} = \dfrac{1}{S'}$

$\dfrac{1}{S'} = \dfrac{-7}{100} \quad S' = \dfrac{-100}{7} = -14.28$

Answer"C.(-14.3) cm"

11.) A certain pressure can rise a column of pure water 0.7 m high , the same pressure will support a column of certain solution 0.3 m high, What is the density of the solution?

A.1167.

B.1750.

C.2333.

D.3500.

— density of water: 10^3

— g=9.8

$P_{water} = P_{Solution}$

$\rho g h_1 = \rho g h_2$

$10^3 (9.8) 0.7 = P_2 (9.8) 0.3$

$10^3 \dfrac{0.7}{0.3} = P_2$

$2.333 \times 10^3 = P_2$

Answer"C.2333"

12.) A wire of nichrome has r= 1mm , L= 2m ,ρ = 1.09 ×10-6 Ω.m ;find the potential difference (V) between the two ends when the current passing through it is 3A:

A.2.76 V.

B.0.69 V.

C.1.38 V.

D.2.07 V.

$V = IR = I \dfrac{\rho L}{A} = \dfrac{3 \times 1.09 \times 10^{-6} \times 2}{\pi (1 \times 10^{-3})^2}$

$= \dfrac{6.54 \times 10^{-6}}{\pi \times 10^{-6}}$

$= 2.08$

Answer"D. 2.07 V"
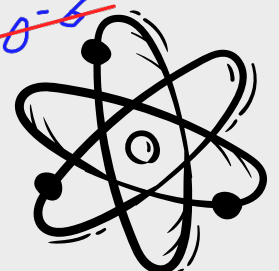
13.) A square hole of 16 cm long each side is cut into sheet of copper If it is heated from 50 F° to 140 F° , the calculated ΔA is:
A.0.435 cm².
B.0.280 cm².
C.0.109 cm².
D.0.245 cm².

$\Delta A = 2\alpha A_0 \Delta T$
$= 2(17\times 10^{-6})(16)^2(32.22)$
$= 280462\times 10^{-6}$
$= 0.280\ cm^2$

$\Delta T = 140 - 50$
$= 90\ F°$
$\Delta T_{C°} = (90-32)\times \dfrac{5}{9}$
$= 32.22\ C°$

Answer"B.0.280 cm²"

14.) A particle start moving from origin at t=0 with v=24x−12y and move (x-y) accesses with constant acceleration given by a= 3x−6y . Find the speed at t=2
A.35.4.
B.38.4.
C.32.5.
D.41.6.

$\to V_1 = 24x - 12y$
$t=0$

$\therefore V = 3xt - 6yt + 24x - 12y$
$V_1 = 3x(2) - 6y(2) + 24x - 12y$
$t=2$
$= 6x - 12y + 24x - 12y$
$= 30x - 24y$

$a = 3x - 6y$
$V = 3xt - 6yt + c$
$V_{t=0} = 3x(0) - 6y(0) + c$
$= c$
$24x - 12y = c$

$V = \sqrt{30^2 + 24^2}$
$= \sqrt{900 + 576}$
$= \sqrt{1476} = 38.41$

Answer"B.38.4"

15.) Mercury will drop a distance of 13×10⁻³m in a narrow tube , if the coefficient of the surface tension for mercury is=0.486 N/m ,density=13600kg/m³ & the contact angle is 140° ,What is the radius of the tube?
A.1.3×10⁻².
B.−4.29×10⁻⁴.
C.1.3×10-3.
D.4.29×10⁻⁴.

$r = \dfrac{2\gamma \cos\theta}{\rho h g}$

$= \dfrac{2(0.486)|\cos 140°|}{13600\ (13\times 10^{-3})\ 9.8}$

$= \dfrac{0.744}{1732.640} = 4.29\times 10^{-4}\ m$

Answer"D.4.29×10-⁴"

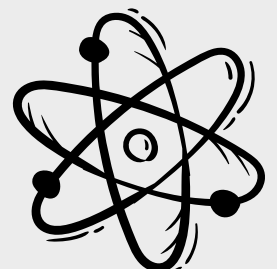**16.) The resistance of a piece of aluminium is measured to be 2.8×10⁻³ Ω , What is the resistance of a piece of glass with same dimension?**
(ρ)aluminium = 2.8×10⁻⁸ Ω.m (ρ)glass = 10¹⁰ Ω.m
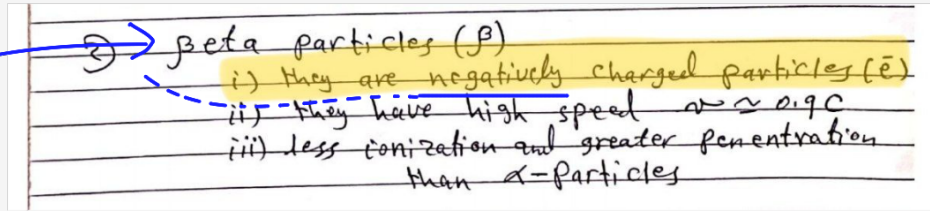A.2.79×10⁻¹⁵ Ω.
B.2.8×10¹⁵ Ω.
C.2.8×10⁻¹ Ω.
D.10¹⁵ Ω.

$R = \rho\dfrac{l}{A}$

$2.8\times 10^{-3} = 2.8\times 10^{-8}\dfrac{l}{A}$

$\dfrac{l}{A} = \dfrac{2.8\times 10^{-3}}{2.8\times 10^{-8}}$

$\dfrac{l}{A} = 10^5\ m^{-1}$

$R_{glass} = \rho\dfrac{l}{A}$
$= 10^{10}\ 10^5$
$= 10^{15}\ \Omega$

Answer"D.10¹⁵Ω"

17.) Which of the following radiation has negative charge?
A.α particles.
B.γ rays.
C.β particles.
D.X rays.

β eta particles (β)
i) they are negatively charged particles (ē)
ii) they have high speed $\nu \simeq 0.9C$
iii) less ionization and greater penetration than α−particles

Answer"C.β particles"

18.)What is the pressure difference between the heart and the brain if the brain is 0.7m above heart?
A.1.38×10⁴.
B.1.54×10⁴.
C.7.42×10³.
D.5.30×10³.

$\Delta P = \rho g h$
$= 1060 (10)(0.7)$
$= 7420$
$= 7.42 \times 10^3$

− Density of the Blood : $1050 \, kg.m^3$
− $g = 10 m/s^2$

Answer"C.7.42×10³"

19.) Given a charge of a particle to be Q= 2t²—3t ,find the current at t=6
A. 5A.
B. 13A.
C. 29A.
D. 21A.

$\frac{dI}{dt} = 4t - 3$

$I = 4t - 3$

$I_1 = 4(6) - 3$
$t=6$

$= 24 - 3$
$= 21 A$

Answer"D. 21A"