سلم تصحيح مقرر اللغة الانكليزية العلمية
لطلاب السنة الثالثة فيزياء - فصل ثاني - عام 2024-2025

1- $\Phi_E = \frac{(16-48.85)10^{-9}}{8.85\times10^{-12}} = \frac{Q_{encl.}}{\varepsilon_0} = 3.7\times10^{3}\ \frac{Nm^2}{C}$ (6 Marks)

2- Torque, weight, Impulse, velocity, Magnetic field, Electric field. (6 Marks)

3- Time, Speed, Distance, Electric flux, Electric potential, Potential Energy (6 Marks)

4- Because the Angle Between Magnetic Force and the Displacement is 90°. Hence, $W = F\Delta r\cos 90 = 0$ (6 Marks)

5-

Torque	Work
vector quantity	scalar quantity.
SI Unit: Nm	→ J.
$\vec{\tau} = \vec{r}\times\vec{F}$	$W = \vec{F}\cdot\Delta\vec{r}$
$\vec{\tau}\perp(\vec{r},\vec{F})$	

(6 Marks)

6-

Displacement	Distance
vector quantity	scalar quantity
$\Delta x = x_f - x_i$ $\overset{+}{\underset{-}{\lesseqgtr}}0$	always positive

(6 Marks)

7- μ_k is pure number without unit.

$\Phi_E = \frac{N m^2}{C}$

$U = J$ (6 Marks)

8- $\vec{P}_i = m\vec{v}_i = -4\hat{i} + 12\hat{j} + 8\hat{k}$

$\vec{P}_f = m\vec{v}_f = -12\hat{i} + 20\hat{j} + 4\hat{k}$

$\vec{I} = \Delta\vec{P} = \vec{P}_f - \vec{P}_i = -8\hat{i} + 8\hat{j} - 4\hat{k}$

$I = 12 \text{ kg m/s}$ (6 Marks)

9- $\sum_{ext.} F = 0$ (6 Marks)

10- $F = q_0 E = 0.04(200) = 8N$ (6 Marks)

11- $W = F_x \Delta x + F_y \Delta y + F_z \Delta z = -3 - 8 = -11 \text{ J}$

$F = \sqrt{25} = 5N$, $\Delta r = \sqrt{5} \Rightarrow W = F \Delta r \cos\theta \Rightarrow$

$\theta = \cos^{-1}\left(\frac{-11}{5\sqrt{5}}\right)^\circ$ (6 Marks)

12- $F_{12} = F_{21} = k_e \frac{|q_1 q_2|}{r_{12}^2} = 8 \times 10^{-5} N$ (6 Marks)

13- $\text{stress} = \frac{mg}{A} = 55 \times 10^7 \ N/m^2$

$\text{strain} = \frac{\text{stress}}{Y} = \frac{55 \times 10^7}{20 \times 10^{10}} = 2.75 \times 10^{-3}$ (6 Marks)

14- Shear stress $\equiv N/m^2$

Shear strain $\equiv$ pure numbe without unit.

Shear Modulus $= N/m^2 \equiv Pa$. (6 Marks)

15- $x = -4t + 2t^3$

$v_x = \frac{dx}{dt} = -4 + 6t^2 \Rightarrow v_x(t=2s) = 20\ m/s$

speed $= |\vec{v}_x| = +20\ m/s$

$a_x = \frac{dv_x}{dt} = 12t \Rightarrow a_x(t=2s) = 24\ m/s^2$.

(6 Marks)

16- (10 Marks)

$\vec{F}_B = q(\vec{v} \times \vec{B}) = q \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ -3 & -2 & 4 \\ 2 & -4 & 6 \end{vmatrix} = (6.4\hat{i} + 41.6\hat{j} + 25.6\hat{k})\ b$

$F_B = \sqrt{(6.4^2 + 41.6^2 + 25.6^2)(10^{-19})^2} = 49.3 \times 10^{-19}\ N$ (5 Marks)

$F_B = qvB\sin\theta$

$v = \sqrt{29}$, $B = \sqrt{56}$

$\Rightarrow \theta = \sin^{-1}\left(\frac{F_B}{qvB}\right) = \sin^{-1}\left(\frac{49.3}{\sqrt{29}\ \sqrt{56}}\right)^{\circ}$ (5 Marks)