ARJUNA (NEET)

Units and Mesurements

P XI M1 Pg12~

DPP-03

1. The force F is given in terms of time t and displacement *x* by the equation

F = A cos Bx + C sin Dt.

12

Then the dimensions of D/B are

(A) $M^0 L^0 T^0$ (B) $M^0 L^0 T^{-1}$

(C) $M^0 L^{-1} T^0$ (D) $M^0 L^1 T^{-1}$

2. When Bernoulli's theorem is expressed as

$$\frac{P}{\rho g} + \frac{1}{2}\frac{v^2}{g} + h = \text{constant}$$

12

the dimensions of the constant on the right hand side of the equation are given as

(A) $M^0 L^0 T^0$ (B) $M^0 L^1 T^0$

(C) $M^1 L^0 T^0$ (D) $M^1 L^2 T^{-2}$

3. The dimensions of coefficient of permittivity for free space (ε_0) in a relation

$$F = \frac{1}{4\pi\varepsilon_0}\frac{q_1 q_2}{r^2},$$

12

where symbols have their usual meanings is

(A) $M^{-1} L^{-3} A^2 T^4$

(B) $M^1 L^3 A^{-2} T^{-4}$

(C) $M^1 L^3 A^2 T^{-4}$

(D) $M^{-1} L^{-3} A^{-2} T^{-4}$

4. The time dependence of a physical quantity *p* is given by $p = p_0 \exp(-\alpha t^2)$, where α is a constant and *t* is the time. The constant α

13

(A) is dimensionless

(B) has dimensions $[T^{-2}]$

(C) has dimensions $[T^2]$

(D) has dimensions of *p*

5. Which of the following equation is dimensionally correct

13

(A) $s = at$ (B) $Q = It$

(C) $v = gt^2$ (D) $v = at + gt^2$

6. The velocity *u* of particles is given in terms of time t by the equation. $u = at + \frac{b}{t^2 + c}$.

The dimension of *a*, *b* and *c* are :

13

(A) L^2, T, LT^2 (B) LT^2, LT, L

(C) LT^{-2}, LT, T^2 (D) L, LT, T^2

7. Pressure gradient *dp*/*dx* is the rate of change of pressure with distance. What are the dimensions of *dp*/*dx* ?

(A) $ML^{-1} T^{-1}$ (B) $ML^{-2} T^{-2}$

(C) $ML^{-1} T^{-2}$ (D) $ML^{-2} T^{-1}$

13

8. The potential energy U of a particle varies with distance *x* from a fixed origin as $U = \frac{A\sqrt{x}}{x^2 + B}$ where A and B are dimensional constants. The dimensional formula for AB is

14

(A) $M^1 L^{7/2} T^{-2}$ (B) $M^1 L^{11/2} T^{-2}$

(C) $M^1 L^{5/2} T^{-2}$ (D) $M^1 L^{9/2} T^{-2}$

9. If force (F), velocity (V) and time (T) are taken as fundamental units, then the dimensions of mass are

(A) $[FVT^{-1}]$ (B) $[FVT^{-2}]$

(C) $[F^{-1} VT^{-1}]$ (D) $[FV^{-1}T]$

14

10. If energy (E), velocity (V) and Force F be taken as Fundamental physical quantity, then what are the dimension of mass.

(A) EV^2 (B) EV^{-2}

(C) FV^{-1} (D) FV^{-2}

14

11. Velocity of object is given as a function of time and position.

$V = \alpha t + \beta x + \gamma$

then dimension of α, β and γ are

14

(A) LT^{-2}, T^{-1}, LT^{-2} (B) LT^{-2}, T^{-1}, LT^{-1}

(C) LT^{-1}, LT^{-2}, T^{-1} (D) LT^{-1}, L, T

ANSWERS

1. **(D)**
2. **(B)**
3. **(A)**
4. **(B)**
5. **(B)**
6. **(C)**
7. **(B)**
8. **(D)**
9. **(D)**
10. **(B)**
11. **(B)**

Note - If you have any query/issue

Mail us at support@physicswallah.org