# ARJUNA-NEET(Physics)

## PRACTICE TEST-01

**1.** Find the value of sin 60°

(A) $\frac{1}{\sqrt{2}}$ (B) $\frac{\sqrt{3}}{2}$

(C) $\frac{1}{2}$ (D) 1

**2.** If $\tan\theta = \frac{3}{4}$ then value of θ is

(A) 37° (B) 90°

(C) 0° (D) 45°

**3.** If tan θ = 2 then sin θ will be

(A) $\frac{2}{\sqrt{5}}$ (B) $\frac{\sqrt{5}}{2}$

(C) $\frac{1}{\sqrt{2}}$ (D) $\frac{\sqrt{3}}{2}$

**4.** Value of cos (2°) will be

(A) 1 (B) 0

(C) $\frac{1}{\sqrt{2}}$ (D) $\frac{\sqrt{3}}{2}$

**5.** Find value of sin θ + cos θ at θ = 45°

(A) $\frac{1}{\sqrt{2}}$ (B) 1

(C) $\sqrt{2}$ (D) $\frac{\sqrt{3}}{2}$

**6.** sin (90 – θ) can be written as

(A) cos θ (B) tan θ

(C) sin θ (D) 1

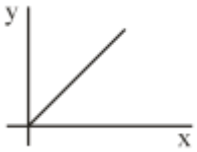
**7.** If y = 3x + 4 then graph between y and x will be

(A) straight line (B) parabola

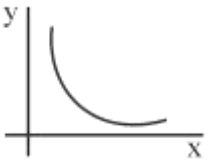
(C) circle (D) hyperbola

**8.** Which of the following graph is correct between y and x where $y = \frac{4}{x^2}$

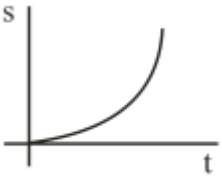
(A) 


(B) 

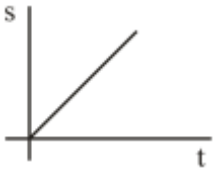

(C) 

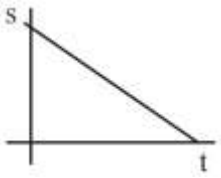

(D) 


**9.** Displacement of object given as $S = \frac{1}{2}a\,t^2$ where a = constant acceleration then correct graph between s and t will be

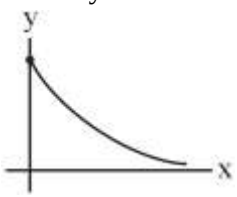
(A) 


(B) 


(C) 

(D) 

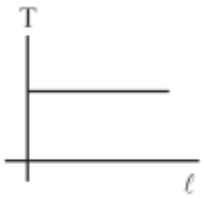

**10.** Graph between y and x given as : then relation between y and x will be

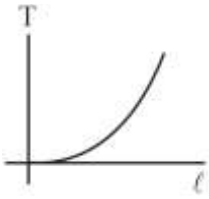



(A) $y = x$ (B) $y = \frac{1}{x}$

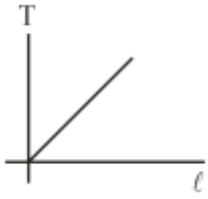
(C) $y = x^2$ (D) $y = e^{-x}$

**11.** Time period of simple pendulum $T = 2\pi\sqrt{\frac{\ell}{g}}$ then graph between 'T' and '$\ell$' where g is constant

(A) 


(B) 


(C) 


(D) 


**12.** If $y = \frac{1}{x^2}$ then find $\frac{dy}{dx}$

(A) $-\frac{1}{x}$ (B) $\frac{-2}{x^3}$

(C) $x^2$ (D) $\frac{1}{x^2}$

**13.** If $y = \sin\theta$ then find $\frac{dy}{dx}$ at $\theta = 45°$

(A) $\frac{1}{\sqrt{2}}$ (B) $\sqrt{2}$

(C) $\frac{\sqrt{3}}{2}$ (D) $\frac{1}{2}$

**14.** If $y = x^2 + 2x - 4$ then find $\frac{dy}{dx}$

(A) $x^2 + x$ (B) $2x + 2$

(C) $x^2 - 4$ (D) $2x + 2$

**15.** If $y = \sin(2x)$ then find $\frac{dy}{dx}$

(A) $2\sin(2x)$ (B) $2\cos(2x)$

(C) $\sin(2x)$ (D) $\cos(2x)$

**16.** If $y = e^{2x}$ then find $\frac{dy}{dx}$

(A) $e^{2x}$ (B) $2e^{2x}$

(C) $2e^{x}$ (D) $2x\,e^{2}$

**17.** If $y = A\sin(kx)$ then find double differential of 'y'

(A) $-AK^2\sin(kx)$ (B) $-AK\cos(kx)$

(C) $+AK^2\cos(kx)$ (D) $AK\sin(kx)$

**18.** At minima slope must be

(A) zero (B) –ve

(C) +ve (D) High

**19.** At maxima slope of graph will be

(A) zero (B) –ve

(C) +ve (D) low

**20.** At maxima double differential will be:
(A) zero (B) –ve
(C) +ve (D) maximum

**21.** If y = 3 sin θ + 4 cos θ then maximum value of y will be
(A) 5 (B) 3
(C) 4 (D) 7

**22.** Find value of $\int_0^{\pi} \sin\theta \, d\theta$
(A) 2 (B) 0
(C) 1 (D) π

**23.** Find dimension of universal gravitational constant 'G'.
(A) $ML^3T^{-2}$ (B) $M^{-1}L^3T^{-2}$
(C) $M^{-1}L^2T^3$ (D) $ML^2T^{-1}$

**24.** Find dimension of surface Tension 's' $\left(S = \frac{F}{\ell}\right)$
(A) $ML^2T^{-2}$ (B) $MLT^{-2}$
(C) $MT^{-2}$ (D) $ML^{-2}$

**25.** A physical quantity is dimensionally correct then it:
(A) must be physically correct
(B) may be physically correct
(C) must be physically wrong
(D) may be physically wrong

**26.** A physical quantity have unit then it
(A) must have dimension
(B) may have dimension
(C) No dimension
(D) can't say

**27.** In an experiment expression of planks constant is given as $h = \frac{\lambda^3}{A}$ where λ is wavelength then find dimension of constant 'A'.
(A) $ML^2T^{+2}$ (B) $ML^{-1}T^{-1}$
(C) $M^{-1}L^1T^1$ (D) $M^{-1}L^{-5}T^{+2}$

**28.** If the unit of force is 10N, the unit of acceleration 2 m/s and unit of velocity is 5 m/s then unit of momentum is
(A) 25 kgm/s (B) 40 kgm/s
(C) 2 kgm/s (D) 10 kgm/s

**29.** The respective number of significant figures for the number
24.403, $2.1 \times 10^{-3}$, 0.0003 and $0.4 \times 10^4$
(A) 5, 2, 1, 1 (B) 5, 2, 1, 2
(C) 5, 2, 4, 2 (D) 5, 5, 4, 1

**30.** Time of 80 oscillation of spring Mass system is measured with stop watch of least count $\frac{1}{2}$ second is 2.5 s, then the permissible error in the measurement is
(A) 10% (B) 20%
(C) 25% (D) 30%

**31.** True value of Mass of pure gold is 46.294 grm. Its Mass of measured by using two different instruments are (1) 46.278 grm and (2) 46.30 grm then :-
(A) 1 is more accurate and precise
(B) 2 is more accurate and precise
(C) 1 is more precise and less accurate
(D) 2 is less accurate more precise

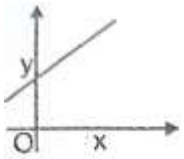
**32.** If the percentage errors in the measurement of physical quantities A, B and C are a, b and c respectively, then total percentage error in the product ABC is
(A) abc (B) a + b + c
(C) ab + bc + ac (D) $\frac{a}{b}+\frac{b}{c}+\frac{c}{a}$

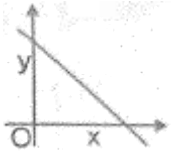
**33.** Which of the following equation can be derived dimensionally?
(A) $s = Vt - \frac{1}{2}at^2$ (B) $F = 6\pi\eta rv$
(C) $I = I_0 e^{-\lambda t}$ (D) $V = \frac{d}{t}$

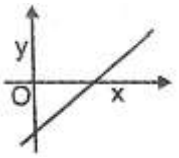
**34.** A force is given as $F = \frac{\alpha^2}{\beta}\cos\left(\frac{v}{\beta}\right)$ where F is force, V is velocity, then dimensional formula of $\alpha^4\beta^{-2}$ is:-

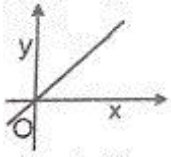
(A) $MLT^{-2}$ (B) $M^2L^2T^{-2}$
(C) $M^2L^2T^{-4}$ (D) $ML^2T^{-2}$

**35.** Which of the following graphs has positive slope (m) and negative intercept (c) on y-axis?

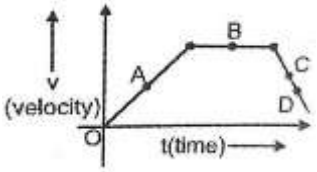
(A) 

(B) 

(C) 

(D) 


**36.** The slope of v – t is zero at point :




(A) A (B) B
(C) C (D) D

**37.** In an experiment four quantities a, b, c and d are measured with percentage error 1%, 2%, 3% and 4% respectively. Quantity P is calculated as follows

$P = \frac{a^3b^2}{cd}$ % error in P is:

(A) 10% (B) 7%
(C) 4% (D) 14%

**38.** The amplitude of a damped oscillator of mass *m* varies with time *t* as

$A = A_0\, e^{(-at/m)}$

The dimensions of a are

(A) $ML^0T^{-1}$ (B) $M^0LT^{-1}$
(C) $MLT^{-1}$ (D) $ML^{-1}T$

**39.** If energy E, velocity V and time T are chosen as the fundamental units, the dimensional formula for surface tension will be

(A) $EV^2T^{-2}$ (B) $EV^{-1}T^{-2}$
(C) $EV^{-2}T^{-2}$ (D) $E^2V^{-1}T^{-2}$

**40.** The velocity of a particle is given by

$v = a + \frac{b}{t} + ct^2$

The unit of b will be

(A) m (B) $ms^2$
(C) $ms^{-1}$ (D) $ms^{-2}$

**41.** What is the dimensional formula of $\frac{\text{Planck's constant t}}{\text{linear momentum}}$ ?

(A) $[M^0L^0T^0]$ (B) $[M^0L^0T]$
(C) $[M^0LT^0]$ (D) $[MLT^{-1}]$

**42.** The force F is given in terms of time t and displacement x by the equation F = A cos Bx + C sin DT. The dimensional formula of D/B is

(A) $[M^0L^0T^0]$ (B) $[M^0L^0T^{-1}]$
(C) $[M^0L^{-1}T^0]$ (D) $[M^0L^1T^{-1}]$

**43.** In wave equation y = a sin (At – Bx), the dimensions of the ratio A/B are

(A) [LT] (B) $[LT^{-1}]$
(C) $[L^{-1}T]$ (D) $[L^0T^0]$

**44.** The dimensional formula $ML^2T^{-2}$ represents

(A) pressure
(B) Linear momentum
(C) Power
(D) Energy

**45.** Error in the measurement of radius of a sphere is 2%. Then error in the measurement of volume is

(A) 2% (B) 4%
(C) 8% (D) 6%

## ANSWERS KEY

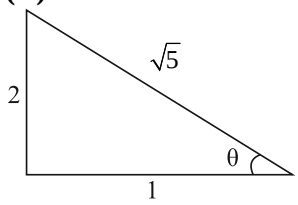
| | | | | | |
|---|---|---|---|---|---|
| **1.** | (B) | **16.** | (B) | **31.** | (C) |
| **2.** | (A) | **17.** | (A) | **32.** | (B) |
| **3.** | (A) | **18.** | (A) | **33.** | (D) |
| **4.** | (A) | **19.** | (A) | **34.** | (C) |
| **5.** | (C) | **20.** | (B) | **35.** | (C) |
| **6.** | (A) | **21.** | (A) | **36.** | (B) |
| **7.** | (A) | **22.** | (A) | **37.** | (D) |
| **8.** | (D) | **23.** | (B) | **38.** | (A) |
| **9.** | (A) | **24.** | (C) | **39.** | (C) |
| **10.** | (D) | **25.** | (B) | **40.** | (A) |
| **11.** | (C) | **26.** | (B) | **41.** | (C) |
| **12.** | (B) | **27.** | (C) | **42.** | (D) |
| **13.** | (A) | **28.** | (A) | **43.** | (B) |
| **14.** | (B) | **29.** | (A) | **44.** | (D) |
| **15.** | (B) | **30.** | (B) | **45.** | (D) |

## HINTS & SOLUTIONS

**1.** **(B)**

**2.** **(A)**

**3.** **(A)**




$\tan\theta = \frac{P}{B} = \frac{2}{1}$

$\sin\theta = \frac{2}{\sqrt{5}}$

**4.** **(A)**

For $\theta < 5°$ $\cos(\theta) = 1$

**5.** **(C)**

$\text{Sin } 45° = \frac{1}{\sqrt{2}}$ $\cos 45° = = \frac{1}{\sqrt{2}}$

**6.** **(A)**

$\text{Sin}(90 - \theta) = \cos\theta$

[All +ve in 1st quadrant]

**7.** **(A)**

y = mx + c Straight Line

**8.** **(D)**

$y \propto \frac{\ell}{x^2}$ As x↑ y↓

**9.** **(A)**

$S \propto t^2$ [parabola symmetric to S-axis]

**10.** **(D)**

$y \propto \frac{1}{x}$

**11.** **(C)**

$T \propto \sqrt{\ell}$ [parabola symmetric to $\ell$-axis]

**12.** **(B)**

$\frac{d}{dx}(x^{-2}) = -2x^{-2-1} = \frac{-2}{x^3}$

**13.** **(A)**

$\frac{d}{d\theta}(\sin\theta) = \cos\theta$

**14.** **(B)**

**15.** **(B)**

$\frac{d}{dx}(\sin 2x) = \cos 2x \frac{d}{dx}(2x) = 2\cos 2x$

**16.** **(B)**

$\frac{d}{dx}(e^{2x}) = e^{2x}\frac{d}{dx}(2x) = 2e^{2x}$

**17.** **(A)**

$\frac{dy}{dx} = Ak\cos kx \Rightarrow \frac{d^2y}{dx^2} = -AK^2\sin kx$

**18.** **(A)**

At Minima slope = 0

**19.** **(A)**

At Maxima slope = 0

**20.** **(B)**

$\frac{d^2y}{dx^2} = -ve$ at maxima

**21.** **(A)**

$y = 3\sin\theta + 4\cos\theta$

$\frac{dy}{d\theta} = 0 \Rightarrow 3\cos\theta + 4\sin\theta = 0$

$\tan\theta = \frac{3}{4}$ $\therefore$ $\theta = 37°$

$y_{max} = 3\times\frac{3}{5} + \frac{4\times 4}{5} = 5$

**22.** **(A)**

$\int_0^{\pi} \sin\theta . d\theta = [-\cos\theta]_0^{\pi}$

**23.** **(B)**

$G = \frac{Fr^2}{m^2} = \frac{(MLT^{-2})L^2}{M^2}$

**24.** **(C)**

$$S = \frac{F}{\ell} = \frac{MLT^{-2}}{L}$$

**25.** **(B)**

**26.** **(B)**

**27.** **(C)**

$E = h\nu \;\therefore\; h = \frac{E}{\nu} = \frac{MLT^{-2}}{T^{-1}}$

$$h = \frac{\gamma^3}{A} \;\therefore\; A = \frac{\lambda^3}{h} = \frac{L^3}{MLT^{-1}}$$

**28.** **(A)**

$$P = m.v. = \left(\frac{10N}{2m/s^2}\right)5 = 25 \text{ kgm/s}$$

**29.** **(A)**

**30.** **(B)**

$$\frac{\Delta T}{T} = \frac{0.5}{2.5} \times 100 = 20\%$$

**31.** **(C)**

**32.** **(B)**

$$\frac{\Delta E}{E} = \frac{\Delta A}{A} + \frac{\Delta B}{B} + \frac{\Delta C}{C} = a + b + c$$

**33.** **(D)**

**34.** **(C)**

$$F = \frac{\alpha^2}{\beta}\overbrace{\cos\left(\frac{\nu}{\beta}\right)}^{\text{dimensionless}}$$

$$F = \left[\frac{\alpha^2}{\beta}\right]^{\text{dimensionless}} \text{: same dimension.}$$

**35.** **(C)**

**36.** **(B)**

**37.** **(D)**

$$\frac{\Delta P}{P} = \frac{3\Delta a}{a} + \frac{2\Delta b}{b} + \frac{\Delta c}{c} + \frac{\Delta d}{d}$$

**38.** **(A)**

$$A = A_0 \quad e^{\frac{-at}{m}} \Rightarrow \text{dimensionless}$$

**39.** **(C)**

$$S = \frac{F}{\ell} = \frac{E}{\ell^2} = \frac{E}{(VT)^2} = EV^{-2}T^{-2}$$

**40.** **(A)**

$$[V] = \left[\frac{b}{t}\right]$$

**41.** **(C)**

$E = h\nu \quad h = \frac{E}{\nu} = \frac{ML^2T^{-2}}{T^{-1}} = ML^2T^{-1}$

**42.** **(D)**

Bx = 1 D T = 1

$B = L^{-1}$ $D = T^{-1}$

**43.** **(B)**

At = 1 Bx = l

$A = T^{-1}$ $B = L^{-1}$

**44.** **(D)**

**45.** **(D)**

$$\frac{\Delta V}{V} = \frac{3\Delta r}{r}$$