NEET PHYSICS PRACITCE PAPER

Time : 60 Mins **1 PHYSICAL WORLD AND MEASUREMENT 1** **Marks : 200**

1. If energy (E), velocity (v) and time (T) were chosen as fundamental physical quantities for measurement, then the dimensional formula for mass will be:
   a) $[E]^1[v]^2\ [T]^1$ b) $[E]^2[v]^{-2}[T]^0$ c) $[E]^1[v]^{-2}[T]^0$ d) $[E]^{-1}[v]^2[T]^1$
2. What is the SI unit of electric field intensity?
   a) Cm b) Vm^{-1} c) Am^{-1} d) NA
3. Which of the following functions of A and B may be performed if A and B possess different dimensions?
   a) A+B b) A-B c) A/B d) A/e^{AB}
4. "The weight of a body is 12 g." This statement is not correct because:
   a) the weight should be expressed in kg b) the correct symbol for gram is gm
   c) the correct symbol for the unit of weight has not been used d) some reason other than those given above
5. If P, Q, R are physical quantities, having different dimensions, which of the following combinations can never be a meaningful quantity?
   a) $\frac{(P-Q)}{R}$ b) PQ - R c) $\frac{PQ}{R}$ d) $\frac{(PR-Q^2)}{R}$
6. When a man is standing, rain drops appear to him falling at 60° from the horizontal from his front side. When he is travelling at 5 km per hour on a horizontal road they appear to him falling at 30°, from the horizontal from his front side. The actual speed of the rain is (in km per hour):
   a) 3 b) 4 c) 5 d) 6
7. Physics involves the study of
   a) plants b) humans c) birds and animals d) nature and natural phenomena
8. The relative density of a material is found by weighing the body first in air and then in water. If the weight in air is (10.0 ± 0.1)gm and weight in water is (5.0 ± 0.1)gm then the maximum permissible percentage error in relative density is:
   a) 1% b) 2% c) 3% d) 5%
9. The SI unit of universal gas constant (R) is :
   a) Watt / K mol b) Newton / K mol c) Joule / K mol d) Erg / K mol
10. The velocity v of a particle at time t is given by $v = at + \frac{b}{t+c}$ where a, b and c are constant. The dimensions of a, b and c are respectively _____
    a) $\mathrm{L}^2,\ \mathrm{T}\ \text{and}\ \mathrm{LT}^2$ b) $\mathrm{LT}^2, \mathrm{LT}\ \text{and}\ \mathrm{L}$ c) $L, LT\ and\ T^2$ d) $\mathrm{LT}^{-2},\ \mathrm{L}\ and\ \mathrm{T}$
11. While measuring acceleration due to gravity by a simple pendulum, a student makes a positive error of 2% in the length of the pendulum and a positive error of 1% in the value of time period. His actual percentage error in the measurement of the value of g will be:
    a) 3% b) 0% c) 4% d) 5%
12. Give the nature of work for which Prof. Albert Einstein, a physicist, was awarded the Nobel Prize in physics:
    a) Wave theory of light b) Theory of relativity c) Photo-electric equation d) Wave-particleduality
13. Suppose refractive index μ is given as: $\mu = A + \frac{B}{\lambda^2}$ Where A and B are constants and λ , is the wavelength, then dimensions of B are same as that of:
    a) wavelength b) volume c) pressure d) area
14. SI units of gas constant are:

a) watt K^{-1} mol^{-1} b) newton K^{-1} mol^{-1} c) joule K^{-1} mol^{-1} d) erg K^{-1} mol^{-1}

15. Gauss is a unit of which of the following quantities?
    a) H b) B c) ϕ d) I
16. The values of two resistors are R_1= (6 ± 0.3)$k\Omega$ and R_2 = (10 ± 0.2)$k\Omega$. The percentage error in the equivalent resistance when they are connected in parallel is :
    a) 5.125% b) 2% c) 3.125% d) 7% e) 10.125%
17. A spherometer has a least count of 0.005 mm and its head scale is divided into 200 equal divisions. The distance between consecutive threads on the spherometer screw is:
    a) 0.005 mm b) 1.0 mm c) 1.0 cm d) 0.0025 mm
18. The unit ofpermittivity of free space, ϵ_o is_____
    a) $Coulomb^2$/ $(Newton\text{-}metre)^2$ b) Coulomb/Newton-metre c) $Newton\text{-}metre^2/Coulomb^2$
    d) $Coulomb^2/Newton\text{-}metre^2$
19. A pressure of 10^6 dyne/cm^2 is equivalent to:
    a) 10^5 N/m^2 b) 10^4 N/m^2 c) 10^6 N/m^2 d) 10^7 N/m^2
20. Which of the following sets of quantities have same dimensional formulae?
    a) Frequency, angular frequency and angular momentum b) Surface tension, stress and spring constant
    c) Acceleration, momentum and retardation d) Thermal capacity, specific heat and entropy
    e) Work, energy and torque
21. The dimensional formula of magnetic flux is :
    a) $[ML^2T^{-2}A^{-1}]$ b) $[ML^0T^{-2}A^{-2}]$ c) $[M^1L^2T^{-2}A^{-1}]$ d) $[ML^2T^{-1}A^3]$
22. Generation, propagation and detection of electromagnetic waves is the basis of
    a) lasers b) reactors c) radio and television d) computer
23. Measure of two quantities along with the precision of respective measuring instrument is A=2.5ms^{-1} ± 0.5 m s^{-1} B=0.10 s± 0.01ls The value of AB will be
    a) (0.25 ± 0.08) m b) (0.25 ± 0.5) m c) (0.25 ± 0.05) m d) (0.25 ± 0.135) m
24. Out of the following the only pair that does not have identical dimensions is:
    a) angular momentum and Planck's constant b) moment of inertia and moment of a force
    c) work and torque d) impulse and momentum
25. Which of the following is unitless quantity?
    a) Pressure gradient b) Displacement gradient c) Force gradient d) Velocity gradient
26. Which of the following forces is not fundamental force in nature?
    a) Gravitational force b) Electromagnetic force c) Strong nuclear force d) Tension
27. The frequency of vibration f of a mass m suspended from a spring of spring constant k is given by a relation of the type $f = Cm^xk^y$, where C is a dimensionless constant. The values of x and y are _____
    a) $x = \frac{1}{2}, y = \frac{1}{2}$ b) $x = -\frac{1}{2}, y = -\frac{1}{2}$ c) $x = \frac{1}{2}, y = -\frac{1}{2}$ d) $x = -\frac{1}{2}, y = \frac{1}{2}$
28. Given that M is the mass suspended from a spring of force constant K. The dimension of the formula for $(M/K)^{1/2}$is same as that for:
    a) frequency b) time period c) velocity d) wavelength
29. The value of resistance is 10.845 Ω and the current is 3.23 A. On multiplying, we get the potential difference is 35.02935 V The value of potential difference in terms of significant figures would be :
    a) 35 V b) 35.0 V c) 35.029 V d) 35.03 V
30. The density of material in CGS system of unit is 4 g/cm^3. In a system of units in which unit of length is 10 cm and unit of mass is 100 g, the value of density of material will be :
    a) 0.4 b) 40 c) 400 d) 0.04

31. **Assertion:** The acceleration due to gravity on the moon is one-sixth that on the earth.
Reason: The law of gravitation is the same on both the moon and the earth.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

32. A physical quantity depends upon five factors, all of which have dimensions; then method of dimensional analysis:
a) can be applied b) cannot be applied c) depends upon factors involved d) both (a) and (c)

33. Assertion: The units of some physical quantities can be expressed as combination of the base units.
Reason: We need only a limited number of units for expressing the derived physical quantities.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false

34. The mass of a body is 20.000 g and its volume is 10.00 cm^3. If the measured values are expressed up to the correct significant figures, the maximum error in the value of density is:
a) 0.001 g cm^{-3} b) 0.010 g cm^{-3} c) 0.100 g cm^{-3} d) none of these

35. The dimensional formula for permeability of free space μ_o is _____
a) $\left[\mathrm{MLT}^{-2}\ \mathrm{A}^{-2}\right]$ b) $\left[\mathrm{ML}^{-1}\ \mathrm{T}^{2}\ \mathrm{A}^{-2}\right]$ c) $\left[\mathrm{ML}^{-1}\ \mathrm{T}^{2}\ \mathrm{A}^{2}\right]$ d) $\left[\mathrm{MLT}^{-2}\ \mathrm{A}^{-1}\right]$

36. Dimensions of Stefan's constant are:
a) $[ML^2T^{-2}]$ b) $\left[ML^2T^{-2}\theta^{-4}\right]$ c) $\left[MT^{-3}\theta^{-4}\right]$ d) $[ML^0T^{-2}]$

37. The energy (E), angular momentum (L) and universal gravitational constant (G) are chosen as fundamental quantities. The dimensions of universal gravitational constant in the dimensional formula of Planck's constant (h) is:
a) zero b) -1 c) $\frac{5}{3}$ d) 1

38. The unit of angular momentum are :
a) kg-m^2/s^2 b) J/s c) J-s d) kg-ms^{-2}

39. The unit of energy is:
a) J/s b) watt-day c) kilowatt d) g-cm/s^2

40. The unit of force and length are doubled, the unit of energy will be:
a) $\frac{1}{4}times$ b) $\frac{1}{2}times$ c) 2 times d) 4 times

41. Which of the following physical quantities has same unit in all the three system of units?
a) Mass b) Length c) Time d) None of these

42. **Assertion:** A stone and a feather dropped from the same height do not reach the ground at the same time.
Reason: Acceleration due to gravity is dependent on the mass of the object.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

43. **Assertion:** In a nuclear process mass gets converted into energy.
Reason: According to Einstein's mass energy equivalence relation, mass m is equivalent to energy E, given by the relation $E = mc^2$ where c is the speed of light in vacuum.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reason are false.

44. A calorie is a unit of heat energy and its value is 4.18 J where 1 J = 1 kg m^2 s^{-2}. Suppose we use a new system of units in which unit of mass equals α kg, the unit of length equals β m and the unit of the time is ϒ sec. Then the value of a calorie in the new system of units is

    a) $4.18\frac{\gamma^2}{\alpha\beta^2}$ b) $4.18\frac{\alpha\beta^2}{\gamma^2}$ c) $4.18\frac{\gamma^2}{\alpha}$ d) $4.18\frac{\beta^2}{\alpha\gamma^2}$

45. Which one of the following is not a derived unit?

    a) joule b) watt c) kilogram d) newton

46. The displacement of a progressive wave is represented by y = A sin(ωt - kx) where x is distance and t is where x is distance and t is time. The dimensions of $\frac{\omega}{k}$ are same as those of :

    a) velocity b) wave number c) wavelength d) frequency

47. Assertion: When we change the unit of measurement of a quantity, its numerical value changes.
    Reason: Smaller the unit of measurement smaller is its numerical value.

    a) If both assertion and reason are true and reason is the correct explanation of assertion.

    b) If both assertion and reason are true but reason is not the correct explanation of assertion.

    c) If assertion is true but reason is false. d) If both assertion and reason are false.

48. The dimensions of capacitance are:

    a) $[ML^{-2}T^2Q^{-2}]$ b) $[M^{-1}L^2T^{-2}Q^2]$ c) $[M^{-1}L^{-2}T^{-2}Q^2]$ d) $[M^{-1}L^{-2}T^2Q^2]$

49. An experiment measured quantities a, b, c and then x is calculated from $x = ab^2/c^3$. If the percentage errors in a, b, c are ±1%, ±3% and ±2% respectively, the percentage error in x can be:

    a) ±13% b) ±7% c) ±4% d) ±1%

50. Which of the following pairs of physical quantities have same dimensions?

    a) Force and power b) Torque and energy c) Torque and powder d) Force and torque