1. The amount of heat produced in an electric circuit depends upon the current (I), resistance (R) and time (t). If the errors created in the measurements of the above quantities are 2%, 1% and 1% respectively then the maximum possible error will be
   a) 1% b) 2% c) 3% d) 6%
2. The ratio of MKS and CGS units of the coefficient of viscosity is
   a) 10 b) 10^2 c) 10^{-1} d) 10^{-2}
3. The unit of the reduction factor of tangent galvanometer is
   a) second b) ampere c) radian d) tesla
4. Which of the following pairs have the same dimensions?
   a) Pressure, stress and force b) Work, power and power factor
   c) Impulse and momentum d) Force, impulse and momentum
5. The unit of coefficient of viscosity in MKS system is
   a) $mkg^{-1}s^{-1}$ b) $kgm^{-1}s^{-1}$ c) $m^{-1}s^{-1}$ d) mkgs
6. The unit of coefficient of viscosity in MKS system is
   a) kgm^5s^{-1} b) kgm^4s^{-2} c) kgm^5s^{-2} d) kgm^5s
7. The dimensions of $\frac{1}{\mu E}$ are equivalent to the dimensions of
   a) velocity b) acceleration c) time d) energy
8. How many significant figures are there in the numbers 108.023 and 0.19?
   a) 6 and 2 b) 2 and 6 c) 3 and 5 d) 5 and 3
9. The number of particles crossing the unit area normal to x-axis per second is represented by the following formula $n = D\frac{n_2 - n_1}{x_2 - x_1}$, where D is the coefficient of diffusion and n_1 and n_2 are the number of molecules per unit volume at x_1 and x_2, respectively, then the dimensions of D are
   a) $M^0L^2T^{-1}$ b) $M^0L^2T^{-2}$ c) M^0LT^{-2} d) M^0LT^{-1}
10. The dimensions of $\frac{L}{R}$ and RC are equivalent to the dimensions of
    a) time b) frequency c) wavelength d) energy
11. In the formula $V = d^a E^b$, if V, E and d are the velocity of longitudinal waves, bulk modulus of elasticity and density of the gaseous medium respectively, then the value of a and b are respectively.
    a) $-\frac{1}{2}$ and $\frac{1}{2}$ b) $\frac{1}{2}$ and $-\frac{1}{2}$ c) $\frac{1}{\sqrt{2}}$ and $\frac{1}{\sqrt{2}}$ d) $\frac{1}{2}$ and $\frac{1}{2}$
12. The dimensional formula for $\frac{1}{2}CV^2$ or or $\frac{1}{2}\frac{q^2}{C}$ or $\frac{1}{2}qV$ is

a) MLT^{-2} b) ML^2T^{-2} c) ML^2T^2 d) $ML^{-2}T^{-3}$

13. If force (F), length (L) and time (T) are presumed to be the fundamental units, then the dimensional formula of mass will be
a) $FL^{-1}T^2$ b) $FL^{-1}T^{-2}$ c) $FL^{-1}T^{-1}$ d) FL^2T^2

14. If L, C and R denote the inductance, capacitance and resistance respectively, the dimensional formula for C^2LR is
a) $ML^{-2}T^{-1}$ b) $M^0L^0T^3$ c) $M^{-1}L^{-2}T^6A^2$ d) $M^0L^0T^2$

15. Using dimensional analysis you can check on some results. In the integral
$\int \frac{dx}{(2ax - x^2)^{1/2}} = a\, n\sin^{-1}\left(\frac{x}{a} - 1\right)$ the value of n is
a) 1 b) – 1 c) 0 d) $\frac{1}{2}$

16. The equation of the stationary wave is $y = 2a \sin\left(\frac{2\pi cl}{\lambda}\right) \cos\left(\frac{2\pi x}{\lambda}\right)$.
Which of the following statements is wrong?
a) The unit of d is same as that of λ b) The unit of x is same as that of λ
c) The unit of $\frac{2\pi c}{\lambda}$ is same as that of $\frac{2\pi x}{\lambda l}$ d) The unit of $\frac{c}{\lambda}$ is same as that of $\frac{x}{\lambda}$

17. A physical quantity is measured and its value is found to be nu where n is numerical value and u is unit. Then which of the following relations is true
a) $n \propto u^2$ b) $n \propto u$ c) $n \propto \sqrt{u}$ d) $n \propto \frac{1}{u}$

18. In C.G.S. system the magnitude of the force is 100 dyne. In another system where the fundamental physical quantities are kilogram, metre and minute, the magnitude of the force is
a) 0.036 b) 0.36 c) 3.6 d) 36

19. The temperature of a body on Kelvin scale is found to be X K. When it is measured by a Fahrenheit thermometer, it is found to be X °F. Then X is
a) 301.25 b) 574.25 c) 313 d) 40

20. Which relation is incorrect?
a) 1 calorie = 4.18 Joule b) 1 = 10^{-10} m
c) 1 MeV = 1.6 x 10^{-11} J d) 1 newton = 10^{-4} dyne

21. To determine the Young's modulus of a wire, the formula is $Y = \frac{F}{A}\frac{L}{\Delta L}$, where L is the length, A is the area of cross-section of the wire, ΔL is the change. In length of the wire when stretched with a force F. the conversion factor to change it from CGS to MKS system is

a) 1 b) 10 c) 0.1 d) 0.01

22. Conversion of 1 MW power on a new system having basic units of mass, length and time as 10 kg, 1 dm and 1 minute respectively is

a) 2.16×10^{12} unit b) 1.26×10^{12} unit c) 2.16×10^{10} unit d) 2×10^{14} unit

23. In two systems, the relations among velocity, acceleration and force are respectively $\upsilon_2 = \frac{\alpha^2}{\beta}\upsilon_1$, $a_2 = \alpha\beta a_1$ and $F_2 = \frac{F_1}{\alpha\beta}$. If α and β are constants then mass, length and time in two systems are related to each as

a) $M_2 = \frac{\alpha}{\beta} M_1$, $L_2 = \frac{\alpha^2}{\beta^2} L_1$, $T_2 = \frac{\alpha^3 T_1}{\beta}$ b) $M_2 = \frac{1}{\alpha^2\beta^2} M_1$, $L_2 = \frac{\alpha^3}{\beta^3} L_1$, $T_2 = \frac{\alpha^-}{\beta^2}$

c) $M_2 = \frac{\alpha^3}{\beta^3} M_1$, $L_2 = \frac{\alpha^2}{\beta^2} L_1$, $T_2 = \frac{\alpha}{\beta} T_1$ d) $M_2 = \frac{\alpha^2}{\beta^2} M_1$, $L_2 = \frac{\alpha}{\beta^2} L_1$, $T_2 = \frac{\alpha^3}{\beta^3} T_1$

24. If the present units of length, time and mass (m, s, kg) are changed to 100m, 100s, and $\frac{1}{10}$kg, then

a) the new unit of velocity is increased 10 times

b) the new unit of force is decreased $\frac{1}{100}$ times

c) the new unit of energy is increased 10 times

d) the new unit of pressure is increased 1000 times

25. Suppose we employ a system in which the unit of mass equals 100 kg, the unit of length equals 1 km and the unit of time 100 s an call the unit of energy cluoj (joule written in reverse order), then

a) 1 joule = 10^4 joule b) 1 joule = 10^{-3} joule

c) 1 joule = 10^{-4} joule d) 1 joule = 10^3 joule