

1. In a vernier callipers,  $(N + 1)$  divisions of vernier scale coincide with  $N$  divisions of main scale. If 1 MSD represents  $0.1 \text{ mm}$ , the vernier constant (in  $\text{cm}$ ) is. **(2024)**  
 (a)  $\frac{1}{100(N+1)}$  (b)  $100 N$   
 (c)  $10(N + 1)$  (d)  $\frac{1}{10 N}$
2. The quantities which have the same dimensions as those of solid angle are. **(2024)**  
 (a) Stress and angle  
 (b) Strain and arc  
 (c) Angular speed and stress  
 (d) Strain and angle
3. A force defined by  $F = \alpha t^2 + \beta t$  acts on a particle at a given time  $t$ . The factor which is dimensionless, if  $\alpha$  and  $\beta$  are constants, is. **(2024)**  
 (a)  $\frac{\alpha t}{\beta}$  (b)  $\alpha \beta t$   
 (c)  $\frac{\alpha \beta}{t}$  (d)  $\frac{\beta t}{\alpha}$
4. The errors in the measurement which arise due to unpredictable fluctuations in temperature and voltage supply are: **(2023)**  
 (a) Random errors  
 (b) Instrumental errors  
 (c) Personal errors  
 (d) Least count errors
5. A metal wire has mass  $(0.4 \pm 0.002) \text{ g}$ , radius  $(0.3 \pm 0.001) \text{ mm}$  and length  $(5 \pm 0.02) \text{ cm}$ . The maximum possible percentage error in the measurement of density will nearly be: **(2023)**  
 (a) 1.4% (b) 1.2%  
 (c) 1.3% (d) 1.6%
6. The area of a rectangular field (in  $\text{m}^2$ ) of length  $55.3 \text{ m}$  and breadth  $25 \text{ m}$  after rounding off the value for correct significant digit is: **(2022)**  
 (a)  $1.38 \times 10^4$  (b) 1382  
 (c) 1382.5 (d)  $14 \times 10^2$
7. The dimensions  $[MLT^{-2}A^{-2}]$  belong to the: **(2022)**  
 (a) magnetic flux  
 (b) self inductance  
 (c) magnetic permeability  
 (d) electric permittivity
8. Plane angle and solid angle have **(2022)**  
 (a) Units but no dimensions  
 (b) Dimensions but no units  
 (c) No units and no dimensions  
 (d) Both units and dimensions
9. If  $E$  and  $G$  respectively denote energy and gravitational constant, then  $E/G$  has the dimensions of **(2021)**  
 (a)  $[M][L^{-1}][T^{-1}]$   
 (b)  $[M][L^0][T^0]$   
 (c)  $[M^2][L^{-2}][T^{-1}]$   
 (d)  $[M^2][L^{-1}][T^0]$
10. A screw gauge gives the following readings when used to measure the diameter of a wire **(2021)**  
 Main scale reading:  $0 \text{ mm}$   
 Circular scale reading: 52 divisions  
 Given that  $1 \text{ mm}$  on main scale corresponds to 100 divisions on the circular scale. The diameter of the wire from the above data is:  
 (a)  $0.026 \text{ cm}$  (b)  $0.26 \text{ cm}$   
 (c)  $0.052 \text{ cm}$  (d)  $0.52 \text{ cm}$
11. If force  $[F]$ , acceleration  $[A]$  and time  $[T]$  are chosen as the fundamental physical quantities. Find the dimensions of energy. **(2021)**  
 (a)  $[F][A][T^2]$   
 (b)  $[F][A][T^{-1}]$   
 (c)  $[F][A^{-1}][T]$   
 (d)  $[F][A][T]$
12. A screw gauge has least count of  $0.01 \text{ mm}$  and there are 50 divisions in its circular scale. The pitch of the screw gauge is: **(2020)**  
 (a)  $0.25 \text{ mm}$  (b)  $0.5 \text{ mm}$   
 (c)  $1.0 \text{ mm}$  (d)  $0.01 \text{ mm}$
13. Taking into account of the significant figures, what is the value of  $9.99 \text{ m} - 0.0099 \text{ m}$ ? **(2020)**  
 (a)  $9.98 \text{ m}$  (b)  $9.980 \text{ m}$   
 (c)  $9.9 \text{ m}$  (d)  $9.9801 \text{ m}$

14. Dimensions of stress are : **(2020)**  
 (a)  $[ML^2T^{-2}]$  (b)  $[ML^0T^{-2}]$   
 (c)  $[ML^{-1}T^{-2}]$  (d)  $[MLT^{-2}]$
15. The intervals measured by a clock gives the following readings:  
 1.25 s, 1.24 s, 1.27 s, 1.21 s and 1.28 s.  
 What is the percentage relative error in the observations? **(2020 Covid Re-NEET)**  
 (a) 4% (b) 16%  
 (c) 1.6% (d) 2%
16. The angle of 1' (minute of arc) in radian is nearly equal to **(2020 Covid Re-NEET)**  
 (a)  $4.85 \times 10^{-4}$  rad (b)  $4.80 \times 10^{-6}$  rad  
 (c)  $1.75 \times 10^{-2}$  rad (d)  $2.91 \times 10^{-4}$  rad
17. In an experiment, the percentage of error occurred in the measurement of physical quantities A, B, C and D are 1%, 2%, 3% and 4% respectively. Then the maximum percentage of error in the measurement of X,  
**(2019)**  
 Where  $X = \frac{A^2B^2}{\frac{1}{C^3D^3}}$  will be  
 (a)  $\left(\frac{3}{10}\right)\%$  (b) 16 %  
 (c) -10 % (d) 10 %
18. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale reading is 5 mm and zero of circular scale division coincides with 25 divisions above the reference level. If screw gauge has a zero error of -0.004 cm, the correct diameter of the ball is **(2018)**  
 (a) 0.053 cm (b) 0.525 cm  
 (c) 0.521 cm (d) 0.529 cm
19. A physical quantity of the dimensions of length that can be formed out of c, G and  $\frac{e^2}{4\pi\epsilon_0}$  is [c is velocity of light, G is universal constant of gravitation and e is charge]:  
**(2017)**  
 (a)  $c^2 \left[ G \frac{e^2}{4\pi\epsilon_0} \right]^{1/2}$   
 (b)  $\frac{1}{c^2} \left[ G \frac{e^2}{4\pi\epsilon_0} \right]^{1/2}$   
 (c)  $\frac{1}{c^2} G \frac{e^2}{4\pi\epsilon_0}$   
 (d)  $\frac{1}{c^2} \left[ G \frac{e^2}{4\pi\epsilon_0} \right]^{1/2}$
20. A student performs an experiment of measuring the thickness of a slab with a vernier caliper whose 50 divisions of the vernier scale are equal to 49 divisions of the main scale. He noted that zero of the vernier scale is between 7.00 cm and 7.05 cm mark of the main scale and 23rd division of the vernier scale exactly coincides with the main scale. The measured value of the thickness of the given slab using the caliper will be: **(2017)**  
 (a) 7.73 cm (b) 7.23 cm  
 (c) 7.023 cm (d) 7.073 cm
21. Planck's constant (h), speed of light in vacuum (c) and Newton's gravitational constant (G) are three fundamental constants. Which of the following combinations of these has the dimension of length? **(2016 - II)**  
 (a)  $\sqrt{\frac{hc}{G}}$  (b)  $\sqrt{\frac{Gc}{h^{3/2}}}$   
 (c)  $\frac{\sqrt{hG}}{c^{3/2}}$  (d)  $\frac{\sqrt{hG}}{c^{5/2}}$
22. If energy (E), velocity (V) and time (T) are chosen as the fundamental quantities, the dimensional formula of surface tension will be: **(2015)**  
 (a)  $[EV^{-1}T^{-2}]$  (b)  $[EV^{-2}T^{-2}]$   
 (c)  $[E^{-2}V^{-1}T^{-3}]$  (d)  $[EV^{-2}T^{-1}]$
23. If dimension of critical velocity of liquid flowing through a tube are expressed as  $v_c \propto [\eta^x \rho^y r^z]$  where  $\eta$ ,  $\rho$  and  $r$  are the coefficient of viscosity of liquid, density of liquid and radius of the tube respectively, then the values of x, y and z are given by:  
**(2015 - Re)**  
 (a) 1, 1, 1 (b) 1, -1, -1  
 (c) -1, -1, 1 (d) -1, -1, -1
24. If Force (F), Velocity (V) and Time (T) are taken as fundamental units, then the dimensions of mass are: **(2014)**  
 (a)  $[FVT^{-1}]$  (b)  $[FVT^{-2}]$   
 (c)  $[FV^{-1}T^{-1}]$  (d)  $[FV^{-1}T]$
25. 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:  
**(2013)**  
 (a) 4% (b) 14%  
 (c) 10% (d) 7%