

1. Match the Column I with Column II.

Column I Event		Column II Time interval (s)	
A)	Life time of an excited state of an atom	p)	10^{17}
B)	Average human life-span	q)	10^{11}
C)	Age of Egyptian pyramids	r)	10^9
D)	Age of the universe	s)	10^{-8}

- a) A – s, B – r, C – q, D – p b) A – p, B – q, C – r, D – s
 c) A – q, B – p, C – s, D – r d) A – r, B – s, C – p, D – q

2. The distance of a galaxy from the earth is of the order of 10^{25} m. The time taken by light to reach the earth from the galaxy is
 a) 3×10^{14} s b) 3×10^{16} s c) 3×10^{18} s d) 3×10^{20} s
3. Light from the sun reaches the earth approximately in
 a) 5 s b) 50 s c) 500 s d) 0.5 s
4. One second is defined as
 a) 1650763.73 periods of krypton clock
 b) 652189.6 periods of krypton clock
 c) 1650763.73 periods of cesium clock
 d) 9192631770 periods of cesium clock
5. Which of the following statements is incorrect?
 a) Every measurement by measuring instrument has some error.
 b) A measurement can have more accuracy but less precision and vice versa.
 c) Every calculated quantity that is based on measured values has some error.
 d) The magnitude of the difference between the true value of the quantity and the individual measurement value is called the relative error of the measurement.
6. A physical quantity X is related to four measurable quantities a, b, c and d as follows

$$X = a^2 b^3 c^{5/2} d^{-2}$$
 The percentage error in the measurement of a, b, c and d are 1%, 2%, 2% and 4% respectively. What is the percentage error in quantity X?
 a) 15% b) 17% c) 21% d) 23%
7. Which of the following time measuring devices is most precise?
 a) A wall clock b) An atomic clock c) A digital watch d) A stop watch
8. Which of the following is the most precise instrument for measuring length?
 a) Metre rod of least count 0.1 cm b) Vernier calipers of least count 0.01 cm
 c) Screw gauge of least count 0.001 cm d) None of these
9. Two resistors of resistances $R_1 = (300 \pm 3) \Omega$ and $R_2 = (500 \pm 4) \Omega$ are connected in series. The equivalent resistance of the series combination is
 a) $(800 \pm 1) \Omega$ b) $(800 \pm 7) \Omega$ c) $(200 \pm 7) \Omega$ d) $(200 \pm 1) \Omega$
10. Percentage errors in the measurement of mass and speed are 2% and 3% respectively. The error in the estimation of kinetic energy obtained by measuring mass and speed will be
 a) 8% b) 2% c) 12% d) 10%

11. The temperatures of two bodies measured by a thermometer are $t_1 = 20 \text{ }^\circ\text{C} \pm 0.5 \text{ }^\circ\text{C}$ and $t_2 = 50 \text{ }^\circ\text{C}$. The temperature difference and the error therein is
 a) $30 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$ b) $70 \text{ }^\circ\text{C} \pm 0.5 \text{ }^\circ\text{C}$ c) $30 \text{ }^\circ\text{C} \pm 0.5 \text{ }^\circ\text{C}$ d) $70 \text{ }^\circ\text{C} \pm 1 \text{ }^\circ\text{C}$
12. The period of oscillation of a simple pendulum is $T = 2\pi\sqrt{\frac{L}{g}}$. Measured value of L is 10 cm known to 1 mm accuracy and time for 100 oscillations of the pendulum is found to be 50 s using a wrist watch of 1 s resolution. What is the accuracy in the determination of g?
 a) 2% b) 3% c) 4% d) 5%
13. Two resistors of resistances $R_1 = (100 \pm 3) \Omega$ and $R_2 = (200 \pm 4) \Omega$ are connected in parallel. The equivalent resistance of the parallel combination is
 a) $(66.7 \pm 1.8) \Omega$ b) $(66.7 \pm 4.0) \Omega$
 c) $(66.7 \pm 3.0) \Omega$ d) $(66.7 \pm 7.0) \Omega$
14. If $Z = \frac{A^4 B^{1/3}}{CD^{3/2}}$ and $\Delta A, \Delta B, \Delta C$ and ΔD are their absolute errors in A, B, C and D respectively. The relative error in Z is
 a) $\frac{\Delta Z}{Z} = 4 \frac{\Delta A}{A} + \frac{1}{3} \frac{\Delta B}{B} + \frac{\Delta C}{C} + \frac{3}{2} \frac{\Delta D}{D}$
 b) $\frac{\Delta Z}{Z} = 4 \frac{\Delta A}{A} + \frac{1}{3} \frac{\Delta B}{B} - \frac{\Delta C}{C} - \frac{3}{2} \frac{\Delta D}{D}$
 c) $\frac{\Delta Z}{Z} = 4 \frac{\Delta A}{A} + \frac{1}{3} \frac{\Delta B}{B} + \frac{\Delta C}{C} - \frac{3}{2} \frac{\Delta D}{D}$
 d) $\frac{\Delta Z}{Z} = 4 \frac{\Delta A}{A} + \frac{1}{3} \frac{\Delta B}{B} - \frac{\Delta C}{C} + \frac{3}{2} \frac{\Delta D}{D}$
15. The value of resistance is 10.845 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
16. The numbers 3.845 and 3.835 on rounding off to 3 significant figures will give
 a) 3.85 and 3.84 b) 3.84 and 3.83
 c) 3.85 and 3.83 d) 3.84 and 3.84
17. The respective number of significant figures for the numbers 6.320, 6.032, 0.0006032 are
 a) 3, 4, 8 b) 4, 4, 8 c) 4, 4, 4 d) 4, 3, 4
18. The radius of a sphere is 1.41. Its volume to an appropriate number of significant figures is
 a) 11.73 cm^3 b) 11.736 cm^3 c) 11.7 cm^3 d) 117 cm^3
19. The mass of a box measured by a grocer's balance is 2.3 kg. Two gold pieces of masses 20.15 g and 20.17 g are added to the box. The total mass of the box is
 a) 2.3 kg b) 2.34 kg c) 2.340 kg d) 2.4303 kg
20. In the question number 69, what is the difference in the masses of the pieces?
 a) 0.02 g b) 0.021 g c) 0.022 g d) 0.024 g
21. A body travels uniformly a distance of $(13.8 \pm 0.2) \text{ m}$ in a time $(4.0 \pm 0.3) \text{ s}$. Its velocity with error limits is
 a) $(3.5 \pm 0.6) \text{ m s}^{-1}$ b) $(3.5 \pm 0.3) \text{ m s}^{-1}$ c) $(6.1 \pm 0.6) \text{ m s}^{-1}$ d) $(6.1 \pm 0.3) \text{ m s}^{-1}$

22. The number of significant figures in the numbers 4.8000×10^4 and 48000.50 are respectively
a) 5 and 6 b) 5 and 7 c) 2 and 7 d) 2 and 6
23. A cube has a side of length 1.2×10^{-2} m. Its volume upto correct significant figures is
a) $1.7 \times 10^{-6} \text{ m}^3$ b) $1.73 \times 10^{-6} \text{ m}^3$ c) $1.70 \times 10^{-6} \text{ m}^3$ d) $1.732 \times 10^{-6} \text{ m}^3$
24. Which of the following statements is incorrect regarding significant figures?
a) All the non-zero digits are significant.
b) All the zeros between two non-zero digits are significant.
c) Greater the number of significant figures in a measurement smaller is the percentage error.
d) The power of 10 is counted while counting the number of significant figures.
25. In an experiment, the period of oscillation of a simple pendulum was observed to be 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s. The mean absolute error is
a) 0.11 s b) 0.12 s c) 0.13 s d) 0.14 s

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