SJM

MONTHLY TEST - JUNE - 2025

11 - Std

PHYSICS

MARKS : 40

Time : 1.30 Hrs.

I **Answer all the questions.** 10 X 1 = 10

1. If the error in the measurement of radius is 2% then the error in the determination of volume of the sphere will be a) 8% b) 2% c) 6% d) 4%
2. If $\pi = 3.14$, then the value of π^2 is a) 9.8596 b) 9.860 c) 9.86 d) 9.9
3. The value of 1 parsec
   a) 3.26 light year b) 3.08 X 10^{16} m c) both d) None of the above
4. Which of the following pairs of physical quantities have same dimension
   a) torque and power b) force and power c) force and torque d) torque and energy
5. Which of the following has the highest number of significant figures?
   a) 600800 b) 5213.00 c) 2.65 X 10^{24}m d) 0.0006032
6. Which of the following method preferred to measure the distance between the planets
   a) Triangulation method b) Parallax method c) RADAR method d) Both (b) and (c)
7. The velocity of a particle v at an instant t is given by $v = at + bt^2$. The dimensions of b is
   a) $[LT^{-2}]$ b) $[LT^{-1}]$ c) $[LT^{-3}]$ d) [L]
8. From the equation $n_1(u_1) = n_2(u_2)$. From this $n_1/n_2 > 1$ means
   a) u_1 is bigger system of units b) u_2 is bigger system of units
   c) u_2 is smaller system of units d) u_1 and u_2 are same system of units
9. If the force is proportional to square of velocity then the dimension of proportionality constant is a) $[MLT^0]$ b) $[ML^{-2}T]$ c) $[ML^{-1}T^0]$ d) $[MLT^{-1}]$
10. How many light year present in 1 metre length
    a) 9.467 X 10^{15} LY b) 1.057 X 10^{-16} LY c) 9.467 X 10^{-15} LY d) 1.057 X 10^{16} LY

II **Answer any three questions. Q.No. 15 is compulsory.** 3 X 2 = 6

11. Define unit. Give their types.
12. Define Precision and Accuracy.
13. State principle of homogeneity?
14. Define Dimensionless constant. Give one example.
15. The temperatures of two bodies measured by a thermometer are $t_1 = (20 \pm 0.5)^0 C$, $t_2 = (50 \pm 0.5)^0 C$. Calculate the temperature difference and the error therein.

III **Answer any three questions. Q.No. 20 is compulsory.** 3 X 3 = 9

16. Write the rules for determining significant figures.
17. What are the limitations of dimensional analysis?
18. Write a short note on Gross error?
19. Explain how will you measure the distance of Moon from the earth?
20. A physical quantity x is given by $x = \frac{a^2 b^3}{c\sqrt{d}}$. If the percentage errors of measurement in a,b, c and d are 4%, 2%, 3% and 1% respectively, then calculate the percentage error in the calculation of x.

IV **Answer any three questions.** 3 X 5 = 15

21. Write a note on triangulation method and RADAR method to measure larger distances.
22. What do you mean by propagation of errors? Explain the propagation of errors in addition and multiplication?
23. Assuming that the frequency γ of a vibrating string may depend upon i) applied force (F) ii) Length (l) iii) mass per unit length (m), prove that $\gamma \alpha \frac{1}{l} = \sqrt{\frac{F}{m}}$ using dimensional analysis.
24. If the value of universal gravitational constant in SI is 6.6X10^{-11} $Nm^2 Kg^{-2}$, then find its value in CGS system?