



UNITS AND MEASUREMENT

Test Paper-I

Max marks: 30

Time: 90Mts

1. Define Unit? [1]
2. What are fundamental and derived units? [1]
3. Name the system of units which is internationally accepted at present [1]
4. Give the SI unit of measurement of Length. Also define the unit [1]
5. Define Candela. [1]
6. Briefly explain how large distances can be measured using parallax method. [2]
7. Calculate the angle of (a) 1° (degree) (b) (minute of arc) and $1''$ (second of arc) in radians [2]
8. A man wishes to estimate the distance of a nearby tower from him. He stands at a point A in front of the tower C and spots a very distant object O in line with AC. He then walks perpendicular to AC up to B, a distance of 100m, and looks at O and C again. Since O is very distant, the direction BO is practically the same as AO; but he finds the line of sight of C shifted from the original line of sight by an angle $\theta = 40^{\circ}$ (θ is known as 'parallax') estimate the distance of the tower C from his original position A. [3]
9. The moon is observed from two diametrically opposite points A and B on Earth. The angle θ subtended at the moon by the two directions of observation is $1^{\circ} 54'$. Given the diameter of the Earth to be about 1.276×10^7 m, compute the distance of the moon from the Earth. [3]
10. The Sun's angular diameter is measured to be $1920''$. The distance D of the Sun from the Earth is 1.496×10^{11} m. What is the diameter of the Sun? [2]
11. Briefly explain how you will estimate the molecular size of oleic acid. [3]
12. If the size of a nucleus (in the range of 10^{-15} to 10^{-14} m) is scaled up to the tip of a sharp pin, what roughly is the size of an atom? Assume tip of the pin to be in the range of 10^{-5} m to 10^{-4} m. [2]
13. Match the following [2]

<u>GROUP-A</u>	<u>GROUP-B</u>
1. 1 Fermi	a. 1.496×10^{11} m
2. 1 light year	b. 3.08×10^{16} m
3. 1 Astronomical Unit	c. 9.46×10^{15} m
4. 1 parsec	d. 10^{-15} m
14. Define one parsec. [1]
15. Give the SI unit of mass. Give the location where the prototypes of International standard units of mass are available. Also define the standard unit of mass. [3]
16. Give the SI value of the following units [2]

a. Roentgen	b. Curie	c. Barn	d. Carat
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