

SECTION – A

[10X2=20M]

NOTE: (i) Answer all questions.

(ii) Each question carries two marks.

(iii) All are very short answer type questions.

1. What is the contribution of S.Chandra sekhar to Physics?
2. The percentage error in the mass and speed are 2% and 3% respectively. What is the maximum error in kinetic energy calculated using these quantities?
3. How is average velocity different from instantaneous velocity?
4. Can two vectors of unequal magnitude add up to give the zero vector?
Can three unequal vectors add up to give the zero vector?
5. What is inertia? What gives the measure of inertia?
6. Why is it easier to balance a bicycle in motion?
7. Two spherical balls each of mass 1kg are placed 1 cm apart. Find the gravitational force of attraction between them.
8. Mention any two examples that obey Bernoullis theorem and justify them.
9. Which of the two will increase the pressure more, an adiabatic or an Isothermal process, in reducing the volume to 50%?
10. Define emissive power and emissivity.

SECTION – B

[6X4=24M]

NOTE: (i) Answer any six of the following questions.

(ii) Each question carries four marks.

(iii) All are short answer type questions.

11. Show that the trajectory of an object thrown at certain angle with the horizontal is a parabola.
12. State the laws of rolling friction.
13. Define vector product. Explain the properties of a vector product with two examples.
14. What is escape velocity? obtain an expression for it.
15. A metal wire of length 2.5 m and area of cross section $1.5 \times 10^{-6} \text{ m}^2$ is stretched through 2mm. Calculate the work done during stretching. ($Y = 1.25 \times 10^{11} \text{ Nm}^{-2}$)
16. Explain hydraulic lift and hydraulic brakes.
17. In what way is the anomalous behaviour of water advantageous to aquatic animals?
18. How specific heat capacity of mono atomic, diatomic and poly atomic gases can be explained on the basis of Law of equipartition of Energy?

SECTION – C

[2X8=16M]

NOTE: (i) Answer any two of the following questions.

(ii) Each question carries eight marks.

(iii) All are long answer type questions.

19. What are collisions? Explain the possible types of collisions? Develop the theory of one dimensional elastic collision.
20. Derive the equation for the kinetic energy and potential energy of a simple harmonic oscillator and show that the total energy of a particle in simple harmonic motion is constant at any point on its path.
What fraction of total energy is K.E when the displacement is one half of a amplitude of a particle executing S.H.M?
21. Explain reversible and irreversible processes. Describe the working of Carnot engine. Obtain an expression for the efficiency.