

PHYSICS YEAR - I**(English version)****MODEL QUESTION PAPER****(For the Academic year 2021 – 2022 only)****Time : 3 Hours****Max. Marks : 60****NOTE:** This question paper consists of three sections A, B and C

SECTION – A**Very Short Answer Type Questions:****(i) Answer Any Ten of the following Questions:****(ii) Each question carries TWO marks****10×2 = 20 M**

1. What is the contribution of S. Chandra Sekhar to physics?
2. Distinguish between accuracy and precision?
3. How can systematic errors be minimized or eliminated?
4. The percentage errors in the mass and speed 2% and 3% respectively. What is the maximum error in kinetic energy. Calculated using these quantities?
5. $A = \vec{i} + \vec{j}$. What is the angle between vector and x – axis?
6. Two forces of magnitude 3 units and 5 units act at 60° with each other. What is the magnitude of their resultant?
7. What is inertia? What gives the measure of inertia.
8. If a bomb at rest explodes into two pieces, the process must travel in opposite directions. Explain?
9. Is, if necessary that mass should be present at the centre of mass of the system? Why? Give examples ?
10. By spinning eggs on a table top, how will you distinguish a hard boiled egg from a raw egg?
11. Why are spokes provided in a bicycle wheel ?
12. Why drops and bubbles are spherical in shape?
13. Define viscosity. What are its units?
14. Write the equation for mean free path.
15. When does a real gas behave like an ideal gas?

SECTION – B

Short Answer Type Questions:

(i) Answer Any Six of the following Questions:

(ii) Each question carries FOUR marks.

6 × 4 = 24 M

16. A car travels the first third of a distance with a speed of 100 kmph. The second third of 20 kmph and the last third of 60 kmph. What is its mean speed over the entire distance ?
17. A parachutist flying in an aero plane. Jumps when it is at a height of 3 km above ground. He opens his parachute when he is about 1 km above ground. Describe his motion.
18. State parallelogram law of vectors. Derive an expression for the magnitude of resultant vector?
19. State, that the trajectory of an object thrown at certain angle with the horizontal is a parabola.
20. If $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$ Prove that the angle between \vec{a} and \vec{b} is 90° .
21. Write the methods to minimize friction?
22. Explain advantages and disadvantages of friction?
23. Distinguish between centre of mass and centre of gravity.
24. Define escape velocity and derive an expression for it.
25. What is a geostationary satellite? State its unit.
26. Explain the behavior of a wire with an increasing load.
27. Explain the importance of anomalous expansion of water in nature.
28. State and explain the first law of thermodynamics.
29. Derive a relation between the two specific heat capacities of gas on the basis of the first law of thermodynamics.

SECTION – C

Long Answer Type Questions:

(i) Answer Any Two of the following Questions:

(ii) Each question carries EIGHT marks

2 × 8 = 16 M

30. (a) Develop the notations of work and energy. Prove work energy theorem.
(b) A machine gun fires 360 bullets per minute and each bullet travels with a velocity of 600 m/s. If the mass of each bullet is 5 gm. Find the power of the machine gun.
31. State and prove law of conservation of energy in case of a freely falling body?
32. Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is seconds pendulum.
33. State and explain Newton's law of cooling state the conditions and under which conditions Newton's law of cooling is applicable. A body cools down from 60° C to 50° c in 5 min and 40° C in another 8 min. Find the temperature of the surroundings.