

Section – A

Answer ALL questions

10 x 2 = 20

1. What is Physics?
2. How can systematic errors be minimized or eliminated?
3. Two forces of magnitude 3 units and 5 units act at 60° with each other. What is the magnitude of their resultant?
4. A horse has to pull harder during the start of a motion than later. Why?
5. What is the principle behind carburetor of an automobile?
6. Why are drops and bubbles spherical?
7. Distinguish between heat and temperature.
8. Why are utensils coated black? Why the bottom of the utensils are made of copper?
9. When does a real gas behave as an ideal gas?
10. State Dalton's law of partial pressure.

Section –B

Answer ANY SIX questions

6 x 4 = 24

11. State parallelogram law of vectors. Derive an expression for the magnitude and direction of the resultant vector.
12. Mention the methods used to decrease friction.
13. Distinguish between centre of mass and centre of gravity.
14. Define angular velocity (ω). Derive $v = r\omega$.
15. What is orbital velocity? Obtain an expression for it.
16. In what way is the anomalous behaviour of water advantageous to aquatic animals?
17. A man runs across the roof of a tall building and jumps horizontally on to the lower roof of an adjacent building. If his speed is 9ms^{-1} , the horizontal distance between the buildings is 10m and height difference between the roofs is 9m, will he be able to land on the next building? (take $g = 10\text{ms}^{-2}$)
18. Describe the behavior of a wire under gradually increasing load.

Section –C

Answer ANY TWO questions

2 x 8 = 16

19. State second law of thermodynamics. How is heat engine different from a refrigerator?
20. Show that the motion of simple pendulum is simple harmonic and hence derive an equation for its time period. What is seconds pendulum?
21. State and prove the law of conservation of energy in case of a freely falling body.
A machine gun fires 360 bullets per minute and each bullet travels with a velocity of 600 ms^{-1} . If the mass of each bullet is 5 grams then find the power of the gun.

Note:

- The questions are obtained from internet and from the students from their interaction for paper discussion after the examination.
- The questions are given here only for ready reference for the students for preparation for upcoming examinations