C

0119

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Total No. of Questions - 21

Total No. of Printed Pages - 2

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No.

Part -III

PHYSICS, Paper - I

(English Version)

Time : 3 Hours

Max. Marks : 60

SECTION – A

10×2=20

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. Chandrasekhar to Physics?
2. Why do we have different units for the same physical quantity?
3. If P = 2i + 4j +14k and Q = 4i + 4j + 10k, find the magnitude of **P + Q**.
4. If a bomb at rest explodes into two pieces, the pieces must travel in opposite directions. Explain.
5. Give the expression for the excess pressure in an air bubble inside the liquid.
6. What are waterproofing agents and water wetting agents? What do they do?
7. Does a body radiate heat at 0 K? Does it radiate heat at 0°C?
8. What is latent heat of vaporization?
9. The absolute temperature of a gas is increased 3 times. What will be the increase in rms velocity of the gas molecule?
10. When does a real gas behave like an ideal gas?

SECTION – B

6×4=24

Note :-

(i) Answer **ANY SIX** questions.
(ii) Each question carries **FOUR** marks.
(iii) All are short answer type questions.

11. A ball is dropped from the roof of a tall building and simultaneously another ball is thrown horizontally with some velocity from the same roof. Which ball lands first? Explain your answer.
12. If $|\vec{a}+\vec{b}| = |\vec{a}-\vec{b}|$ prove that the angle between $\vec{a}$ and $\vec{b}$ is 90°.
13. Distinguish between centre of mass and centre of gravity.
14. Define vector product. Explain the properties of a vector product with two examples.
15. What is orbital velocity? Obtain an expression for it.
16. Describe the behaviour of a wire under gradually increasing load.
17. Explain conduction, convection and radiation with examples.
18. Mention the methods used to decrease friction.

SECTION – C

2×8=16

Note :-

(i) Answer **ANY TWO** questions.
(ii) Each question carries **EIGHT** marks.
(iii) All are long answer type questions.

19. Develop the notions of work and kinetic energy and show that it leads to work-energy theorem.
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 5gm, find the power of the machine gun.
20. Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is seconds pendulum?
21. Explain reversible and irreversible processes. Describe the working of Carnot engine. Obtain an expression for the efficiency.
