AIMSTURIAL.IN Model guess paper-1 - March - 2019

INTERMEDIATE I-YEAR PHYSICS-1

Time: 3hours PHYSICS-1 Max.Marks:100

INSTRUCTIONS:

- 1. Q.Nos: 1 10 are Very Short Answer Type. Each question carries 2 marks.
- 2. Q. Nos: 11 18 are Short Answer Type. Each question carries 4 marks.
- 3. Q.Nos: 19 21 are Long Answer Type. Each question carries 7 marks.
- I. Answer ALL questions in 2 or 3 lines each.

 $[10 \times 2 = 20]$

- 1. What is the contribution of S. Chandra Sekhar to Physics?
- 2. A vehicle travel half distance L with speed V₁ and other half speed V₂ what is the average speed?
- 3. Give an example where the velocity of an object is zero but its acceleration is not zero.
- 4. What is the acceleration of a projectile at the top of its trajectory?
- 5. A = i + j what is the angle between the vector and x-axis.
- 6. If the vectors \vec{A} and \vec{B} have same magnitude. Their resultant \vec{C} has the magnitude same as that of either \vec{A} or \vec{B} . Find the angle between \vec{A} and \vec{B} .
- 7. If a bomb at rest explodes into two pieces, the pieces must travel in opposite directions. Explain?
- 8. Can the coefficient of friction be greater than one?
- 9. Why does the car with flattened type stop sooner than the one with inflated tyres?
- 10. What happens to the coefficient of friction if the weight of the body is doubled?
- II. Answer any SIX of the following questions in about 75 words each.

 $[6 \times 4 = 24]$

- 11. A particle moves in a straight line with uniform acceleration. Its velocity at time t = 0 is V_1 and at time t = t is V_2 the average velocity of the particle in this time interval is $(V_1 + V_2)/2$ is this correct? Substantiate your answer.
- 12. Show that the trajectory of an object thrown at certain angle with the horizontal is a parabola.
- 13. Show that the maximum height and range of a projectile are $\frac{u^2 \sin^2 \theta}{2g}$ and $\frac{u^2 \sin 2\theta}{g}$ respectively were

the terms have their regular meaning

- 14. Why is pulling the lawn roller preferred to pushing it? Explain in detail
- 15. State the laws of rolling friction .
- 16. A motorist drives north for 30 min at 85 kmph and then stops for 15 min. He continues travelling north and covers 130 km in 2 hours. What is his total displacement and average velocity.
- 17. Define the terms momentum and impulse. State and explain the law of conservation of linear momentum. Give examples.
- 18. Explain the terms the average velocity and instantaneous velocity. When are they equal?
- III. Answer any TWO of the following questions in about 300 words each. $[2 \times 8 = 16]$
- a) State Newton's second law of motion. Hence derive the equation of motion F = ma from it.b) A body is moving along a circular path such that its speed always remains constant. Should there be force acting on the body?
- 20. Define Angle of friction and Angle of repose. Show that angle of friction is equal to angle of repose for a rough inclined plane. A block of mass 4 kg is resting on a rough horizontal plane and is about to move when a horizontal force of 30 N is applied on it. g =10ms². Find the total contact force exerted by the plane on the block.
- 21. a) State parallelogram law of vectors. Derive an expression for the magnitude and direction of the resultant vector.
 - b) Two forces of magnitudes 3 units and 5 units act at 60^0 with each other. What is the magnitude of their resultant?