

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Sc PHYSICS**

**[For Mathematical Combination] - W.E.F. 2020-21**

**Model question paper**

Time: 3 hrs

Max. Marks: 75

**SECTION-A**

**(Short Answer Type Questions)**

Answer any five out of the following eight questions

5x5=25

1. Write a note on scattering cross-section.
2. Write Euler's equations for a rigid rotating body.
3. If the mean distance of Mars from the Sun is 1.524 times that of the earth. Find the period of revolution of Mars about the Sun.
4. What is length contraction and obtain an expression for it
5. At what speed the mass of an object will be double of its value at rest.
6. Write briefly on forced oscillations
7. Write a short note on coupled oscillators
8. Write any five applications of ultrasonic waves

**SECTION-B**

**(Essay type questions)**

Answer All questions with internal choice from each Unit

5x10=50

9. a).Derive an expression for the velocity of a rocket moving under the influence of earth's gravitational field.

Or

- b).Define rigid body. Deduce an equation of motion for a rotating rigid body.

10. a).What is a central force? Deduce an equation of motion of a particle under the action of central force.

Or

b).State and prove Kepler's laws of planetary motion.

11. a).Describe the Michelson-Morley experiment and explain the significance of negative result.

Or

b).State postulates of special theory of relativity. Derive Einstein's mass energy relation

12. a).What is simple harmonic motion and derive an equation of motion of a simple harmonic oscillator.

Or

b).Determine spring constant of springs in series method by dynamic method.

13. a).What are transverse waves? Derive an expression for its velocity along a stretched string.

Or

b).What are Ultrasonics? Derive any method of production of Ultrasonics.

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