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| <p style="text-align: center;"><b>Anjuman Islam Janjira Degree College of Science</b><br/> <b>Murud-Janjira, Raigad-402401</b><br/> <b>Affiliated to University of Mumbai</b></p> |                                        |
| <b>Class: -S.Y.B.Sc.</b>                                                                                                                                                          | <b>Subject: - Physics Minor Course</b> |
| <b>Semester: - III</b>                                                                                                                                                            | <b>Course code: -</b>                  |
| <b>Exam Event: - Winter 2025 (SH)</b>                                                                                                                                             | <b>Marks: - 30</b>                     |
| <b>Date: - 14/10/2025</b>                                                                                                                                                         | <b>Duration: - 1 Hours</b>             |

**N.B.**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat labelled diagrams wherever necessary.



**Q: 1 A) Attempt any TWO of the following.**

**10**

- 1) Define Work and Calculate the workdone when the force and the displacement are not in the same direction.
- 2) Write the difference between conservative and non-conservative force.
- 3) Show the relation between elastic constant  $\frac{3}{Y} = \frac{1}{3K} + \frac{1}{\eta}$
- 4) Derive the relation of energy stored in a strained body.

**Q: 1 B) Attempt any ONE of the following.**

**05**

- 1) A bullet of mass 2 kg was moving with a speed of 400 m/s. after passing through a solid substance, it is continuing to move at the rate of 100 m/s. how much work the bullet had to do in passing through a solid substance?
- 2) Calculate the extension produced in a wire of length 2 m and radius  $0.013 \times 10^{-2} \text{ m}$  due to a force of 14.7 N applied along its length. Young modulus of the material of the wire is  $Y = 21 \times 10^{11} \text{ N/m}^2$ .

**Q: 2 A) Attempt any TWO of the following.**

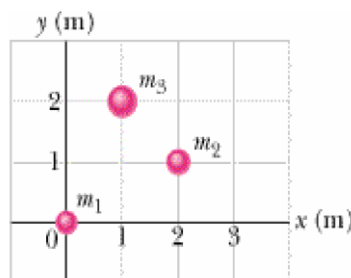
**10**

- 1) Elaborate the concept of momentum for a two particle system.
- 2) Write difference between Elastic and Non-Elastic Collision.
- 3) What is Gravitational Potential Energy? Derive the relation of it.
- 4) Describe the concept of Gravitational Field and Derive the relation  $g_h = g \left( \frac{R}{R+h} \right)^2$ .

**Q: 2 B) Attempt any ONE of the following.**

**05**

- 1) Three particle of masses  $m_1 = 2 \text{ kg}$ ,  $m_2 = 3 \text{ kg}$  and  $m_3 = 5 \text{ kg}$  are arranged in XY plane as shown in fig. find the position vector of the center of mass.



- 2) Two point masses  $M_1 = 3 \times 10^4 \text{ kg}$  and  $M_2 = 12 \times 10^4 \text{ kg}$  separated by 10m distance find the gravitational potential at the point 3 m from  $M_1$  and 7 m from  $M_2$ .