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# JEE MAIN SYSTEM OF PARTICLES AND ROTATIONAL MOTION — MOTION OF CENTRE OF MASS — PYQS

**Max. Marks:** 12 **Questions:** 3

## Section A (MCQ) — 3 questions

**Q.1** Two identical bodies A and B of equal masses have initial velocities $\vec{v}_1 = 4\hat{i}$ m/s and $\vec{v}_2 = 4\hat{j}$ m/s respectively. The body A has acceleration $\vec{a}_1 = 6\hat{i} + 6\hat{j}$ m/s$^2$ while the acceleration of the other body B is zero. The centre of mass of the two bodies moves in _____ path.

[JEE Main 2026 (Online) 6th April Evening Shift]

(1) circular (2) parabolic
(3) straight line (4) elliptical

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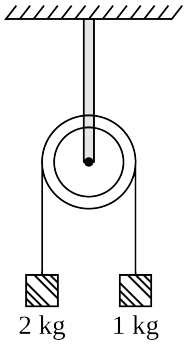
**Q.2** Two blocks of masses 2 kg and 1 kg respectively, are tied to the ends of a string which passes over a light frictionless pulley as shown in the figure below. The masses are held at rest at the same horizontal level and then released. The distance traversed by the centre of mass in 2 s is _____ m. (Take g = 10 m/s$^2$)

[JEE Main 2026 (Online) 2nd April Evening Shift]




(1) 3.33 (2) 3.12 (3) 2.22 (4) 1.42

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**Q.3** Given below are two statements :

**Statement-I:** For a mechanical system of many particles total kinetic energy is the sum of kinetic energies of all the particles.

**Statement-II:** The total kinetic energy can be the sum of kinetic energy of the center of mass w.r.t. the origin and the kinetic energy of all the particles w.r.t. the center of mass as the reference.

In the light of the above statements, choose the correct answer from the options given below :

[JEE Main 2026 (Online) 22nd January Evening Shift]

(1) Both Statement-I and Statement-II are false
(2) Statement-I is false but Statement-II is true
(3) Statement-I is true but Statement-II is false
(4) Both Statement-I and Statement-II are true

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## ANSWER KEY

| Ques. | 1 | 2 | 3 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ans. | 3 | 3 | 4 | | | | | | | | |