PART 1 - PHYSICS

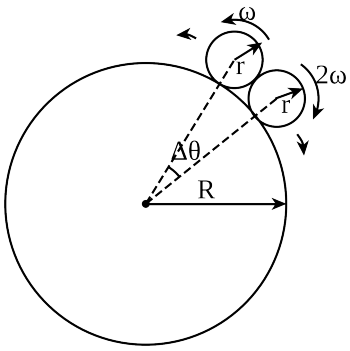
Topic : System of particles and rotational motion

SECTION–1 : (Maximum Marks : 6)

- This section contains **TWO** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks	: +3	If ONLY the correct option is chosen;
Zero Marks	: 0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	: −1	In all other cases.

1. Consider a large disk of radius R and two smaller disks, each of radius r = R/50, lying on its circumference, as shown in the figure. The smaller disks are initially in contact with each other, with an angular separation $\Delta\theta$ between their centers. They are made to roll without slipping in opposite directions, with constant angular velocities ω and 2ω while the large disk is held stationary. The time τ at which the smaller disks are again in contact is:
[Use $\sin(\Delta\theta) = \Delta\theta$ and ignore gravity.] [JEE Advanced 2026 Paper 1]



(A) $\tau = 51 \times \left(2\pi - \frac{4}{51}\right)/\omega$

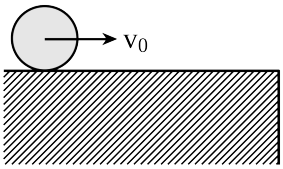
(B) $\tau = 51 \times \left(2\pi - \frac{2}{51}\right)/3\omega$

(C) $\tau = 51 \times \left(2\pi - \frac{4}{51}\right)/3\omega$

(D) $\tau = 51 \times \left(2\pi - \frac{2}{51}\right)/\omega$

Scan or tap for the full solution

2. A solid cylinder of radius R rolls without slipping with a center of mass speed $v_0 = \sqrt{\frac{gR}{3}}$ on a horizontal surface with a vertical edge, as shown in the figure. Here, g is the acceleration due to the gravity. At the moment when the cylinder loses contact with the surface due to rotation around the corner, the speed of its center of mass is: [JEE Advanced 2026 Paper 1]



Space for Rough Work

(A) 0 (B) $\sqrt{\frac{5gR}{7}}$ (C) $\sqrt{\frac{gR}{15}}$ (D) $\sqrt{\frac{3gR}{7}}$

Scan or tap for the full solution

Space for Rough Work

JEE ADVANCED SYSTEM OF PARTICLES AND ROTATIONAL MOTION — ROLLING MOTION — PYQS

Test Pattern : **JEE (Advanced)**

ANSWER KEY

SECTION–1																														
Ques.	1	2																												
Ans.	**C**	**B**																												