**ROTATIONAL D'\'NA.MICS**

**ASSl6NMENT-1**

Question- 1Answer in brief

1. Why are curved roads bunked?
2. Do we need a banked road for a two· wheeler? Explain.
3. On what factors does the frequency of a conical pendulum depends? Is it independent of some factors?
4. Why is tt useful to define radius of gyration?
5. A uniform disc and a hollow right circular cone have the sam(fo!Jllula for their Ml .. when rotating about their central axes. Why is it so?

Question- 2 While driving along an unbanked circular coa ; -wheeler rider has to lean with the vertical. Why is tt so? With what anglGii::{j ef has to lean? Derive the relevant expression.Why such a leaning is7eces$?- for a lour wheeler?

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Question- 3 Using the energy conservat e the expressions tor the minimum speeds at different locations along a v:t" r motion controlled by gravity.Is zero speed possible at lhe uppezc pi"iJ,? Under what condition *I s?* Also prove lhal the difference between th li),e t sions (or normal forces) depends only upon the weight of the object.

Question- 4 Discuss ssily of radius of gyration. Define il. On what lactors does It depend d *dp* n t depend? CAN you locate some similarity between the centre of ma s a radius of gyration? What can you infer if a uniform ring and a uniform dis ve e same radius of gyration?

Question- 5 State the conditions under which the theorems of parallel axes and perpendicular axes are applicable. State the respective mathematical expressions.

Question- 6 Derive an expression that relates angular momentum wtth the angular velocity of a rigid body.

Question- 7 Obtainan expression relating the torque with angular acceleration for a rigid body.

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Question- 8 Discuss the interlink between translational rotational and total kinetic energies of a rigid object that rolls without slipping.

Question- 9 All the solved numericals in the text book.

Quest ion- 10 All the numericals in the exercise of the text-book.

II



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