(Source: 2012-DSE-PHY-1B-Q3a(ii))

(Only need to respond to part 3a(ii).

Figure 3.1

Figure 3.1 shows the top view of a horizontal road with two circular lanes. A car of mass 1200 kg moves with constant speed in lane 1 of radius 45 m.

(a) (i) Name the force that provides the centripetal force for the car. If the maximum value of this force is 8000 N, calculate the highest speed of the car such that it can keep in lane 1.

(ii) Suppose the car takes lane 2 instead of lane 1 and the maximum value of the force providing the centripetal force is still 8000 N. Would the car’s highest speed in lane 2 be smaller than, larger than or the same as that found in (a)(i)? Explain.

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| **BR Steps** | **Referring to the Question** |
| 1. State the subject matter to make judgment on |  |
| 2. State the relevant Physics knowledge |  |
| 3. Apply the knowledge to the question |  |
| Write the answer in Exposition format |  |