

# **QUESTION 1: MOTION, ENERGY AND POWER**

1.1 State the law of conservation of energy in words. (2)

1.2 A motorcar with a mass of 0,9 ton is parked on an incline AB of 1 : 20. The motorcar departs from rest at A and within 12 seconds reaches a speed of 144 km/h.

If all frictional losses are neglected, calculate:



- 1.2.1 The acceleration of the car from A to B
- 1.2.2 The pulling force of the car's engine
- 1.2.3 The length of the gradient
- 1.2.4 The power of the car's engine
- 1.2.5 The potential energy at B (5 x 2) (10)

1.3 A Gautrain experiences a tractive resistance of 280 N per 1 000 kg when it moves.

If the Gautrain exerts a force of 80 kN when it has a mass of 40 000 kg, calculate the acceleration of the Gautrain. (4)

**[16]**

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**Jiyuan Zhang**



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