

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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Table of Contents Engineering Science Paper N3 2014

1. Understanding the eBook Engineering Science Paper N3 2014
 - The Rise of Digital Reading Engineering Science Paper N3 2014
 - Advantages of eBooks Over Traditional Books
2. Identifying Engineering Science Paper N3 2014
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Engineering Science Paper N3 2014
 - User-Friendly Interface
4. Exploring eBook Recommendations from Engineering Science Paper N3 2014
 - Personalized Recommendations
 - Engineering Science Paper N3 2014 User Reviews and Ratings
 - Engineering Science Paper N3 2014 and Bestseller Lists
5. Accessing Engineering Science Paper N3 2014 Free and Paid eBooks
 - Engineering Science Paper N3 2014 Public Domain eBooks
 - Engineering Science Paper N3 2014 eBook Subscription Services
 - Engineering Science Paper N3 2014 Budget-Friendly Options
6. Navigating Engineering Science Paper N3 2014 eBook Formats

- ePub, PDF, MOBI, and More
 - Engineering Science Paper N3 2014 Compatibility with Devices
 - Engineering Science Paper N3 2014 Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Engineering Science Paper N3 2014
 - Highlighting and Note-Taking Engineering Science Paper N3 2014
 - Interactive Elements Engineering Science Paper N3 2014
 8. Staying Engaged with Engineering Science Paper N3 2014
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Engineering Science Paper N3 2014
 9. Balancing eBooks and Physical Books Engineering Science Paper N3 2014
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Engineering Science Paper N3 2014
 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
 11. Cultivating a Reading Routine Engineering Science Paper N3 2014
 - Setting Reading Goals Engineering Science Paper N3 2014
 - Carving Out Dedicated Reading Time
 12. Sourcing Reliable Information of Engineering Science Paper N3 2014
 - Fact-Checking eBook Content of Engineering Science Paper N3 2014
 - Distinguishing Credible Sources
 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
 14. Embracing eBook Trends
 - Integration of Multimedia Elements
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