



basic education

Department
Basic Education
REPUBLIC OF SOUTH AFRICA

FULL MEMORANDUM GRADE 12 PHYSICS 2022 FINAL

This question paper consists of 18 pages and 3 data sheets.

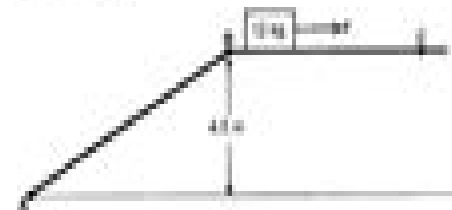
(QUESTION 6 (Start on a new page.)

A 12 kg block is initially at rest at point A at the bottom of a ROUGH inclined plane. The block is pulled up the incline by a constant force F acting parallel to the incline. The block reaches point B, which is at a vertical height of 4.0 m above the horizontal, with a speed of 2.0 m/s. See the diagram below.



- 6.1 Define the term non-conservative force.
- 6.2 Draw a labelled free-body diagram for the block when it is pulled up the incline.
- 6.3 Calculate the total work done on the block by the NON-CONSERVATIVE forces when the block moves from point A to point B. (5)

The same constant force F now moves the block at a CONSTANT VELOCITY across a rough horizontal surface from point B to point C, as shown below. Force F acts parallel to the horizontal surface.



The magnitude of the constant frictional force acting on the block while moving from point B to point C is 40 N, 40% greater than the magnitude of the constant frictional force acting on the block when it moves from point A to point B.

- 6.4 Calculate the distance from point A to point B. (5)

Memorandum For Physics Grade November 2013

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Food Processing Stephanie Clark, Stephanie Jung, Buddhi Lamsal, 2014-06-03 FOOD PROCESSING Food Processing Principles and Applications Second Edition is the fully revised new edition of this best selling food technology title Advances in food processing continue to take place as food scientists and food engineers adapt to the challenges imposed by emerging pathogens environmental concerns shelf life quality and safety as well as the dietary needs and demands of humans In addition to covering food processing principles that have long been essential to food quality and safety this edition of Food Processing Principles and Applications unlike the former edition covers microbial enzyme inactivation kinetics alternative food processing technologies as well as environmental and sustainability issues currently facing the food processing industry The book is divided into two sections the first focusing on principles of food processing and handling and the second on processing technologies and applications As a hands on guide to the essential processing principles and their applications covering the theoretical and applied aspects of food processing in one accessible volume this book is a valuable tool for food industry professionals across all manufacturing sectors and serves as a relevant primary or supplemental text for students of food science

Ploughshares and Swords Jayita Sarkar, 2022-07-15 India's nuclear program is often misunderstood as an inward looking endeavor of secretive technocrats In Ploughshares and Swords Jayita Sarkar challenges this received wisdom narrating a global story of India's nuclear program during its first forty years The book foregrounds the program's civilian and military features by probing its close relationship with the space program Through nuclear and space technologies India's leaders served the technopolitical aims of economic modernity and the geopolitical goals of deterring adversaries The politically savvy transnationally connected scientists and engineers who steered the program obtained technologies materials and information through a variety of state and nonstate actors from Europe and North America including both superpowers They thus maneuvered around Cold War politics and the choke points of the nonproliferation regime Hyperdiversification increased choices for the leaders of the nuclear program but reduced democratic accountability at home The nuclear program became a consensus enforcing device in the name of the nation Ploughshares and Swords is a provocative new history with global implications It shows how geopolitical and technopolitical visions influence decisions about the nation after decolonization Thanks to generous funding from the Swiss National Science Foundation the ebook editions of this book are available as Open Access volumes from Cornell Open cornellpress.cornell.edu/cornell-open and other repositories

Redefining Geek Cassidy Puckett, 2022-04-20 A surprising and deeply researched look at how everyone can develop tech fluency by focusing on five easily developed learning habits Picture a typical computer geek Likely white male and someone you'd say has a natural instinct for technology Yet after six years teaching technology classes to first generation low income middle school students in Oakland California Cassidy Puckett has seen firsthand that being good with technology is not something people are born with it's something they learn In Redefining Geek she overturns the stereotypes around the

digitally savvy and identifies the habits that can help everyone cultivate their inner geek Drawing on observations and interviews with a diverse group of students around the country Puckett zeroes in on five technology learning habits that enable tech savvy teens to learn new technologies a willingness to try and fail management of frustration and boredom use of models and the abilities to use design logic and identify efficiencies In *Redefining Geek* she shows how to measure and build these habits and she demonstrates how many teens historically marginalized in STEM are already using these habits and would benefit from recognition for their talent access to further learning opportunities and support in career pathways She argues that if we can develop recognize and reward these technological learning habits in all kids especially girls and historically marginalized racial and ethnic groups we can address many educational inequities and disparities in STEM Revealing how being good with technology is not about natural ability but habit and persistence *Redefining Geek* speaks to the ongoing conversation on equity in technology education and argues for a more inclusive technology learning experience for all students

Knowledge Discovery in Big Data from Astronomy and Earth Observation Petr Skoda,Fathalrahman Adam,2020-04-09 Knowledge Discovery in Big Data from Astronomy and Earth Observation Astrogeoinformatics bridges the gap between astronomy and geoscience in the context of applications techniques and key principles of big data Machine learning and parallel computing are increasingly becoming cross disciplinary as the phenomena of Big Data is becoming common place This book provides insight into the common workflows and data science tools used for big data in astronomy and geoscience After establishing similarity in data gathering pre processing and handling the data science aspects are illustrated in the context of both fields Software hardware and algorithms of big data are addressed Finally the book offers insight into the emerging science which combines data and expertise from both fields in studying the effect of cosmos on the earth and its inhabitants

Christian Advocate ,1907 **In the Shadow of the Bomb** S. S. Schweber,2013-10-31 How two charismatic exceptionally talented physicists came to terms with the nuclear weapons they helped to create In 1945 the United States dropped the bomb and physicists were forced to contemplate disquieting questions about their roles and responsibilities When the Cold War followed they were confronted with political demands for their loyalty and McCarthyism s threats to academic freedom By examining how J Robert Oppenheimer and Hans A Bethe two men with similar backgrounds but divergent aspirations and characters struggled with these moral dilemmas one of our foremost historians of physics tells the story of modern physics the development of atomic weapons and the Cold War Oppenheimer and Bethe led parallel lives Both received liberal educations that emphasized moral as well as intellectual growth Both were outstanding theoreticians who worked on the atom bomb at Los Alamos Both advised the government on nuclear issues and both resisted the development of the hydrogen bomb Both were in their youth sympathetic to liberal causes and both were later called to defend the United States against Soviet communism and colleagues against anti Communist crusaders Finally both prized scientific community as a salve to the apparent failure of Enlightenment values Yet their responses to the use of the atom

bomb the testing of the hydrogen bomb and the treachery of domestic politics differed markedly Bethe who drew confidence from scientific achievement and integration into the physics community preserved a deep integrity By accepting a modest role he continued to influence policy and contributed to the nuclear test ban treaty of 1963 In contrast Oppenheimer first embodied a new scientific persona the scientist who creates knowledge and technology affecting all humanity and boldly addresses their impact and then could not carry its burden His desire to retain insider status combined with his isolation from creative work and collegial scientific community led him to compromise principles and ironically to lose prestige and fall victim to other insiders S S Schweber draws on his vast knowledge of science and its history in addition to his unique access to the personalities involved to tell a tale of two men that will enthrall readers interested in science history and the lives and minds of great thinkers **Parliamentary Debates (Hansard)**. Great Britain. Parliament. House of Commons,2012

Announcer American Association of Physics Teachers,1997 European Yearbook / Annuaire Européen, Volume 60 (2012) Council of Europe,2013-12 The European Yearbook promotes the scientific study of nineteen European supranational organisations and the OECD Each volume contains a detailed survey of the history structure and yearly activities of each organisation and an up to date chart providing a clear overview of the member states of each organisation **Government Reports Announcements & Index** ,1986-07 Engineering News-record ,1893

Unveiling the Energy of Verbal Artistry: An Mental Sojourn through **Memorandum For Physics Grade November 2013 Memorandum**

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