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EDUCATION
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

PHYSICAL SCIENCES P2 (CHEMISTRY)

PREPARATORY EXAMINATION

SEPTEMBER 2022

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Physical Science Paper September 2012 Memorandum

Albert A Gayle



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The Secure and the Dispossessed Nick Buxton, Ben Hayes, 2015-11-20 While the world's scientists and many of its inhabitants despair at the impact of climate change corporate and military leaders see nothing but opportunities For them melting ice caps mean newly accessible fossil fuels borders to be secured from climate refugees social conflicts to be managed and more failed states in which to intervene They are securing their assets at the expense of the planet and its inhabitants The Secure and the Dispossessed looks at these deadly approaches with a critical eye It also considers the flip side that the legitimacy of the elite is under unprecedented pressure from resistance by communities to resource grabs to those creating new ecological and socially just models for managing our energy food and water Topics covered include geoengineering militarism refugee protection greenwashing and the agricultural crisis among others Adaptation and resilience to a climate changed world is desperately needed but the form it will take will affect all of our futures

The Age of Radiance Craig Nelson, 2014-03-25 Radiation is a complex and paradoxical concept staggering amounts of energy flow from seemingly inert rock and that energy is both useful and dangerous While nuclear energy affects our everyday lives from nuclear medicine and food irradiation to microwave technology its invisible rays trigger biological damage birth defects and cellular mayhem From the end of the nineteenth century through the use of the atomic bomb in World War II to the twenty first century's confrontation with the dangers of nuclear power Craig Nelson illuminates a pageant of fascinating historical figures Enrico Fermi Marie and Pierre Curie Albert Einstein FDR Robert Oppenheimer and Ronald Reagan among others He reveals many little known details including how Jewish refugees fleeing Hitler transformed America from a country that created light bulbs and telephones into one that split atoms how the most grotesque weapon ever invented could realize Alfred Nobel's lifelong dream of global peace how emergency workers and low level utility employees fought to contain a runaway nuclear reactor while wondering if they would live or die Brilliantly fascinating and remarkably accessible The Age of Radiance traces mankind's complicated and difficult relationship with the dangerous power it discovered and made part of civilization

Coercive Care Bernadette McSherry, Ian Freckelton, 2013-06-26 There has been much debate about mental health law reform and mental capacity legislation in recent years with the UN Convention on the Rights of Persons with Disabilities also having a major impact on thinking about the issue This edited volume explores the concept of coercive care in relation to individuals such as those with severe mental illnesses those with intellectual and cognitive disabilities and those with substance use problems With a focus on choice and capacity the book explores the impact of and challenges posed by the provision of care in an involuntary environment The contributors to the book look at mental health capacity and vulnerable adults' care as well as the law related to those areas The book is split into four parts which cover human rights and coercive care legal capacity and coercive care the legal coordination of coercive care and coercive care and individuals with cognitive impairments The book covers new ground by exploring issues arising from the coercion of persons with

various disabilities and vulnerabilities helping to illustrate how the capacity to provide consent to treatment and care is impaired by reason of their condition

Spacecraft Dynamics and Control Enrico Canuto, Carlo Novara, Donato Carlucci, Carlos Perez-Montenegro, Luca Massotti, 2018-03-08 Spacecraft Dynamics and Control The Embedded Model Control Approach provides a uniform and systematic way of approaching space engineering control problems from the standpoint of model based control using state space equations as the key paradigm for simulation design and implementation The book introduces the Embedded Model Control methodology for the design and implementation of attitude and orbit control systems The logic architecture is organized around the embedded model of the spacecraft and its surrounding environment The model is compelled to include disturbance dynamics as a repository of the uncertainty that the control law must reject to meet attitude and orbit requirements within the uncertainty class The source of the real time uncertainty estimation prediction is the model error signal as it encodes the residual discrepancies between spacecraft measurements and model output The embedded model and the uncertainty estimation feedback noise estimator in the book constitute the state predictor feeding the control law Asymptotic pole placement exploiting the asymptotes of closed loop transfer functions is the way to design and tune feedback loops around the embedded model state predictor control law reference generator The design versus the uncertainty class is driven by analytic stability and performance inequalities The method is applied to several attitude and orbit control problems The book begins with an extensive introduction to attitude geometry and algebra and ends with the core themes state space dynamics and Embedded Model Control Fundamentals of orbit attitude and environment dynamics are treated giving emphasis to state space formulation disturbance dynamics state feedback and prediction closed loop stability Sensors and actuators are treated giving emphasis to their dynamics and modelling of measurement errors Numerical tables are included and their data employed for numerical simulations Orbit and attitude control problems of the European GOCE mission are the inspiration of numerical exercises and simulations The suite of the attitude control modes of a GOCE like mission is designed and simulated around the so called mission state predictor Solved and unsolved exercises are included within the text and not separated at the end of chapters for better understanding training and application Simulated results and their graphical plots are developed through MATLAB Simulink code

Mason and McCall Smith's Law and Medical Ethics Kenyon Mason, Graeme Laurie, Alexander McCall Smith, 2013-06-06 This classic textbook focuses on medical law and its relationship with medical practice and modern ethics Offering medical as well as legal facts it provides thorough coverage of all of the topics found on medical law courses and in depth analysis of recent court decisions encouraging students to think analytically about the subject

Artificial Intelligence, Cybersecurity and Cyber Defence Daniel Ventre, 2020-11-03 The aim of the book is to analyse and understand the impacts of artificial intelligence in the fields of national security and defense to identify the political geopolitical strategic issues of AI to analyse its place in conflicts and cyberconflicts and more generally in the various forms of violence to explain the appropriation of

artificial intelligence by military organizations but also law enforcement agencies and the police to discuss the questions that the development of artificial intelligence and its use raise in armies police intelligence agencies at the tactical operational and strategic levels **Scientists' Expertise as Performance** Joris Vandendriessche,Evert Peeters,Kaat Wils,2015-10-06

The essays in this collection explore our reliance on experts within a historical context and across a wide range of fields including agriculture engineering health sciences and labour management Contributors argue that experts were highly aware of their audiences and used performance to gain both scientific and popular support Breakout Newt

Gingrich,2013-11-04 It is not between the Left and the Right but between the past and the future America is on the edge of a breakout In fact we are poised for one of the most spectacular leaps in human well being in history Pioneers of the future innovators and entrepreneurs are achieving breakthroughs in medicine transportation energy education and other fields that will make the world a dramatically different and better place Unless the prison guards of the past stop them Every American must choose a side Will you be a champion of the future or a prisoner of the past Every potential breakthrough has to get past a host of individuals and institutions whose power and comfort depend on the status quo These prison guards of the past will strangle every innovation that threatens to change the way things have always been done if we let them *Native*

Games Chris Hallinan,Barry Judd,2013-07-19 Research on Indigenous participation in sport offers many opportunities to better understand the political issues of equality empowerment self determination and protection of culture and identity This volume compares and conceptualises the sociological significance of Indigenous sports in different international contexts

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Sister Elizabeth Kenny and her efforts to have her unorthodox methods of treating polio accepted as mainstream polio care in the United States during the 1940s A case study of changing clinical care and an examination of the hidden politics of philanthropies and medical societies Creativity in Large-Scale Contexts Jonathan S. Feinstein,2023-11-07 A new model

for smarter creativity Innovators and creators work in cultural economic and social contexts that shape their work These contexts are large scale filled with overwhelming multitudes of elements and possibilities but these contexts can be fruitfully mined by creative teams Creativity in Large Scale Contexts by Yale professor Jonathan S Feinstein introduces a groundbreaking new network model to describe how successful innovation can be focused generated and accelerated The book will help teams and organizations innovate smarter and faster Feinstein argues that in large scale contexts creativity happens most efficiently when it is actively guided by a creative leader or team Guiding creativity involves understanding

navigating and actively using the cultural context identifying puzzles and opportunities and spanning these tensions to create novel connections With thoughtful guidance creators and creative teams can find their way through the thicket of possibilities faster smarter and with less waste Creativity in Large Scale Contexts draws on case studies of famous creators including Virginia Woolf Albert Einstein Indigenous artist Clifford Possum transgender activist and engineer Lynn Conway and Twitter cofounder Jack Dorsey Empirically grounded this book will be essential for teaching and managing creativity and innovation and will open new avenues for future intellectual growth and practice in the field

Neurotrauma Nadine Abelson-Mitchell, 2013-02-26 Neurotrauma Managing Patients with Head Injuries is a comprehensive holistic evidence based approach to the primary secondary and tertiary care of a person with neurotrauma Using a patient centred needs approach to enhance the quality of care of head injured patients family and carers this multidisciplinary book enables the reader to apply the knowledge skills and attitudes learned to the practice of neurotrauma in all settings It explores Anatomy and physiology of the brain Pharmacology for neurotrauma patients Assessment of the patient with neurotrauma Management of neurotrauma in a range of settings including at the scene in the emergency department and at the hospital Neuro rehabilitation Community care Nursing management of the patient This practical resource includes activities exercises and ethical and legal considerations throughout making it ideal reading for all staff working in neuroscience emergency critical and rehabilitation settings

Advances in Computational Intelligence Ignacio Rojas, Gonzalo Joya, Andreu Catala, 2015-06-05 This two volume set LNCS 9094 and LNCS 9095 constitutes the thoroughly refereed proceedings of the 13th International Work Conference on Artificial Neural Networks IWANN 2015 held in Palma de Mallorca Spain in June 2013 The 99 revised full papers presented together with 1 invited talk were carefully reviewed and selected from 195 submissions The papers are organized in topical sections on brain computer interfaces applications and tele services multi robot systems applications and theory MRSAT video and image processing transfer learning structures algorithms and methods in artificial intelligence interactive and cognitive environments mathematical and theoretical methods in fuzzy systems pattern recognition embedded intelligent systems expert systems advances in computational intelligence and applications of computational intelligence

Unclear Physics Målfrid Braut-Hegghammer, 2016-08-01 Many authoritarian leaders want nuclear weapons but few manage to acquire them Autocrats seeking nuclear weapons fail in different ways and to varying degrees Iraq almost managed it Libya did not come close In Unclear Physics Målfrid Braut Hegghammer compares the two failed nuclear weapons programs showing that state capacity played a crucial role in the trajectory and outcomes of both projects Braut Hegghammer draws on a rich set of new primary sources collected during years of research in archives fieldwork across the Middle East and interviews with scientists and decision makers from both states She gained access to documents and individuals that no other researcher has been able to consult Her book tells the story of the Iraqi and Libyan programs from their origins in the late 1950s and 1960s until their dismantling This book reveals contemporary perspectives

from scientists and regime officials on the opportunities and challenges facing each project Many of the findings challenge the conventional wisdom about clandestine weapons programs in closed authoritarian states and their prospects of success or failure Braut Hegghammer suggests that scholars and analysts ought to pay closer attention to how state capacity affects nuclear weapons programs in other authoritarian regimes both in terms of questioning the actual control these leaders have over their nuclear weapons programs and the capability of their scientists to solve complex technical challenges

Principles of Object-Oriented Modeling and Simulation with Modelica 3.3 Peter Fritzson,2015-01-06 Fritzson covers the Modelica language in impressive depth from the basic concepts such as cyber physical equation base object oriented system model and simulation while also incorporating over a hundred exercises and their solutions for a tutorial easy to read experience The only book with complete Modelica 3.3 coverage Over one hundred exercises and solutions Examines basic concepts such as cyber physical equation based object oriented system model and simulation

The Big Con Nate Hendley,2016-09-06 This book examines a broad range of infamous scams cons swindles and hoaxes throughout American history and considers why human gullibility continues in an age of easy access to information Covering American cons and hoaxes past and present including the Great Moon Hoax of 1835 the controversy over subliminal messaging do bands filmmakers and advertisers really put secret messages in their works the panic about satanic daycare operators in the 1980s and recent Internet scams this book provides a fascinating fact based look at infamous frauds across the centuries Offering an engaging mix of history sociology and psychology author Nate Hendley gives readers an appreciation of how prominent scams cons confidence men and hoaxes have impacted American society past and present Each entry details the scheme or hoax and the pertinent con artist schemer involved examining the sociological cultural political and or economic effect of the scams Each topic is accompanied by a short bibliography of further reading selections As the old saying goes There is a sucker born every minute and there has always been a keen eyed swindler to take advantage of the situation The Big Con Great Hoaxes Frauds Gifts and Swindles in American History explores this sordid underbelly of American civilization and invites readers to revel in the felonious experience

Environmental Risk Assessment Ted Simon,2014-02-05 The purpose of risk assessment is to support science based decisions about how to solve complex societal problems The problems we face in the twenty first century have many social political and technical complexities Environmental risk assessment in particular is of increasing importance as a means of seeking to address the potential effects of

Academic Librarianship Today Todd Gilman,2017-02-02 Intended for use by both librarians and students in LIS programs Academic Librarianship Today is the most current comprehensive overview of the field available today Key features include Each chapter was commissioned specifically for this new book and the authors are highly regarded academic librarians or library school faculty or both Cutting edge topics such as open access copyright digital curation and preservation emerging technologies new roles for academic librarians cooperative collection development and resource sharing and

patron driven acquisitions are explored in depth Each chapter ends with thought provoking questions for discussion and carefully constructed assignments that faculty can assign or adapt for their courses The book begins with Gilman s introduction an overview that briefly synthesizes the contents of the contributors chapters by highlighting major themes The main part of the book is organized into three parts The Academic Library Landscape Today Academic Librarians and Services Today and Changing Priorities New Directions *Transitions to Alternative Vehicles and Fuels* National Research Council, Division on Engineering and Physical Sciences, Board on Energy and Environmental Systems, Committee on Transitions to Alternative Vehicles and Fuels, 2013-04-14 For a century almost all light duty vehicles LDVs have been powered by internal combustion engines operating on petroleum fuels Energy security concerns about petroleum imports and the effect of greenhouse gas GHG emissions on global climate are driving interest in alternatives Transitions to Alternative Vehicles and Fuels assesses the potential for reducing petroleum consumption and GHG emissions by 80 percent across the U S LDV fleet by 2050 relative to 2005 This report examines the current capability and estimated future performance and costs for each vehicle type and non petroleum based fuel technology as options that could significantly contribute to these goals By analyzing scenarios that combine various fuel and vehicle pathways the report also identifies barriers to implementation of these technologies and suggests policies to achieve the desired reductions Several scenarios are promising but strong and effective policies such as research and development subsidies energy taxes or regulations will be necessary to overcome barriers such as cost and consumer choice

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