



# basic education

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REPUBLIC OF SOUTH AFRICA

**NATIONAL  
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**GRADE 12**

**PHYSICAL SCIENCES: PHYSICS (P1)**

**EXEMPLAR 2014**

**MARKS: 150**

**TIME: 3 hours**

**This question paper consists of 16 pages and 3 data sheets.**

# 2014 Exemplar Papers Physical Sciences

**BM King**



## **2014 Exemplar Papers Physical Sciences:**

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straightforward presentation of the key components of research and the skills they need to read and evaluate it The book covers a range of research that students are most likely to encounter from experimental to field research and archival to evaluation research The Second Edition features updated examples of research across disciplines new and updated content on qualitative research and conceptual statistics and a streamlined organization that better aligns with the order of information in a research article Handbook of Research on Soft Computing and Nature-Inspired Algorithms Shandilya, Shishir K., Shandilya, Smita, Deep, Kusum, Nagar, Atulya K., 2017-03-10 Soft computing and nature inspired computing both play a significant role in developing a better understanding to machine learning When studied together they can offer new perspectives on the learning process of machines The Handbook of Research on Soft Computing and Nature Inspired Algorithms is an essential source for the latest scholarly research on applications of nature inspired computing and soft computational systems Featuring comprehensive coverage on a range of topics and perspectives such as swarm intelligence speech recognition and electromagnetic problem solving this publication is ideally designed for students researchers scholars professionals and practitioners seeking current research on the advanced workings of intelligence in computing systems

**Historical Studies in the Physical Sciences** ,1982 **In the Shadow of the Machine** Jeremy Naydler, 2018-05-29 Contemporary life is so deeply reliant upon digital technology that the computer has come to dominate almost every aspect of our culture What is the philosophical and spiritual significance of this dependence on electronic technology both for our relationship to nature and for the future of humanity And what processes in human perception and awareness have produced the situation we find ourselves in As Jeremy Naydler elucidates in this penetrating study we cannot understand the emergence of the computer without seeing it within the wider context of the evolution of human consciousness which has taken place over millennia Modern consciousness he shows has evolved in conjunction with the development of machines and under their intensifying shadow The computer was the product of a long historical development culminating in the scientific revolution of the 17th century It was during this period that the first mechanical calculators were invented and the project to create more complex thinking machines began in earnest But the seeds were sown many hundreds of years earlier deep in antiquity Naydler paints a vast panorama depicting human development and the emergence of electronic technology His painstaking research illuminates an urgent question that concerns every living person today What does it mean to be human and what if anything distinguishes us from machines **Bulletin of the Institute of Classical Studies of the University of London** ,2000 *Modeling for Prediction of Radiation-Induced Toxicity to Improve Therapeutic Ratio in the Modern Radiation Therapy Era* Ester Orlandi, Tiziana Rancati, Giuseppe Sanguineti, Claudio Fiorino, Riccardo Valdagni, 2021-07-27

**Paradigm Changes Are Required in HIV Vaccine Research** Marc H. V. Van Regenmortel, 2015-12-08 In his 1962 book *The Structure of Scientific Revolutions* Thomas Kuhn famously argued that researchers in every field of scientific enquiry always operate under a set of presuppositions known as paradigms that are rarely explicitly stated In the field of HIV

vaccine research several prevailing paradigms led scientists for many years to pursue unfruitful lines of investigations that impeded significant progress The uncritical acceptance of reigning paradigms makes scientists reluctant to abandon their mistaken assumptions even when they obtain results that are not consistent with the paradigms The following five paradigms which disregard the degeneracy of the immune system were particularly harmful

- 1 There is a primary and intrinsic epitope specific for each B cell receptor and for the corresponding monoclonal antibody In reality there is no single intrinsic or real epitope for any antibody but only a diverse group of potential ligands
- 2 Reactions with monoclonal antibodies are more specific than the combined reactivity of polyclonal antibodies In reality a polyclonal antiserum has greater specificity for a multiepitopic protein because different antibodies in the antiserum recognize separate epitopes on the same protein giving rise to an additive specificity effect By focusing vaccine design on single epitope Mab pairs the beneficial neutralizing synergy that occurs with polyclonal antibody responses is overlooked
- 3 The HIV epitope identified by solving the crystallographic structure of a broadly neutralizing Mab HIV Env complex should be able when used as immunogen to elicit antibodies endowed with the same neutralizing capacity as the Mab Since every anti HIV bnMab is polyspecific the single epitope identified in the complex is not necessarily the one that elicited the bnMab Since hypermutated Mabs used in crystallographic studies differ from their germline like receptor version present before somatic hypermutation the identified epitope will not be an effective vaccine immunogen
- 4 Effective vaccine immunogenicity can be predicted from the antigenic binding capacity of viral epitopes Most fragments of a viral antigen can induce antibodies that react with the immunogen but this is irrelevant for vaccination since these antibodies rarely recognize the cognate intact antigen and even more rarely neutralize the infectivity of the viral pathogen that harbors the antigen
- 5 The rational design of vaccine immunogens using reverse vaccinology is superior to the trial and error screening of vaccine candidates able to induce protective immunity One epitope can be designed to increase its structural complementarity to one particular bnMab but such antigen design is only masquerading as immunogen design because it is assumed that antigenic reactivity necessarily entails the immunogenic capacity to elicit neutralizing antibodies When HIV Env epitopes engineered to react with a bnMab are used to select from human donors rare memory B cells secreting bnAbs this represents antigen design and not immunogen design

The aim of this Research Topic is to replace previous misleading paradigms by novel ones that better fit our current understanding of immunological specificity and will help HIV vaccine development

**Studies in Latin Literature and Roman History** Carl Deroux, 2010     **The Journal of Physical Chemistry**, 1900     **Blake Studies**, 1970     Qualitative Methods in Sports Studies David L. Andrews, Daniel S. Mason, Michael L. Silk, 2005-09 This book makes a timely contribution to a broader methodological project as the first systematic examination and explication of qualitative research methods within sports studies Qualitative Methods in Sports Studies assesses a variety of approaches ranging from social historical media text and personal narrative to ethnographic and interview based qualitative research methodologies Drawing on the diversity of sport

studies literature contributors outline the major issues and strategies associated with each method This practical research guide is an essential reference tool for students and scholars of sport and leisure studies      **Caii Julii Caesaris Opera Omnia; ad optimorum exemplarium fidem recensita, notulis sermone anglicano exaratis illustrata ... in usum scholarum** Julius Caesar,1873      *Science Education for Elementary Teachers* Ann Benbow,Colin Mably,2002 This book reflects its authors many years of experience in elementary school teaching pre service and in service education in science and substantial work in science curriculum development It is derived from informed by and directly linked to both the Benchmarks for Science Literacy and the National Research Council s National Science Education Standards No other methods book integrates standards to this degree Written with the idea that students learn science by doing this well respected author team focus on the constructivist approach and the integrating of science with other elementary academic subjects      *Bücher-Verzeichnis von Mayer & Müller, Berlin* ,1882      Historical Studies in the Physical and Biological Sciences ,1996      The Oracle ,1882

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