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KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

PHYSICAL SCIENCES P2 (CHEMISTRY)

COMMON TEST

JUNE 2024

MARKING GUIDELINES

MARKS: 100

These marking guidelines consist of 10 pages.

Exemplar 2 physical Science Paperjunegrade 12

**Jennifer Wilhelm, Ronald
Wilhelm, Merryn Cole**



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Resources in Education ,2000-10 *Chemical News and Journal of Physical Science* William Crookes,James H. Gardiner,Gerald Druce,H. W. Blood-Ryan,1888 **Life-Cycle of Structures and Infrastructure Systems** Fabio Biondini,Dan M. Frangopol,2023-06-28 Life Cycle of Structures and Infrastructure Systems collects the lectures and papers presented at IALCCE 2023 The Eighth International Symposium on Life Cycle Civil Engineering held at Politecnico di Milano Milan Italy 2 6 July 2023 This Open Access Book contains the full papers of 514 contributions including the Fazlur R Khan Plenary Lecture nine Keynote Lectures and 504 technical papers from 45 countries The papers cover recent advances and cutting edge research in the field of life cycle civil engineering including emerging concepts and innovative applications related to life cycle design assessment inspection monitoring repair maintenance rehabilitation and management of structures and infrastructure systems under uncertainty Major topics covered include life cycle safety reliability risk resilience and sustainability life cycle damaging processes life cycle design and assessment life cycle inspection and monitoring life cycle maintenance and management life cycle performance of special structures life cycle cost of structures and infrastructure systems and life cycle oriented computational tools among others This Open Access Book provides an up to date overview of the field of life cycle civil engineering and significant contributions to the process of making more rational decisions to mitigate the life cycle risk and improve the life cycle reliability resilience and sustainability of structures and infrastructure systems exposed to multiple natural and human made hazards in a changing climate It will serve as a valuable reference to all concerned with life cycle of civil engineering systems including students researchers practitioners consultants contractors decision makers and representatives of managing bodies and public authorities from all branches of civil engineering Municipal Journal and Public Works ,1908 Science for the Elementary and Middle School Edward Victor,Richard Dean Kellough,2000 Text is appropriate for Elementary or Middle School Science Methods This highly successful science methods text provides current sources of pedagogy subject matter content and exploratory activities in science that are essential for a complete science course The content correlates to the NSES standards examines the most effective teaching methods and explores how science instruction can help children improve their knowledge and information processing skills The experienced authors share the best of practice the most useful research findings and their richest experiences Appropriate for education courses the text is designed to instruct future educators in the fundamentals of teaching science at the elementary and middle school levels Presents strategies that integrate learning Provides illustrations of how they may be used Increases the emphasis on how students can access science information and make sense of it through the use of visual and technological tools More than 750 activities and experiments for the elementary school curriculum Includes exploratory activities that teachers can use immediately These useful activities ensure that students take a han **Creating Project-Based STEM Environments** Jennifer Wilhelm,Ronald Wilhelm,Merryn Cole,2019-02-05 This

book models project based environments that are intentionally designed around the United States Common Core State Standards CCSS 2010 for Mathematics the Next Generation Science Standards NGSS Lead States 2013 for Science and the National Educational Technology Standards ISTE 2008 The primary purpose of this book is to reveal how middle school STEM classrooms can be purposefully designed for 21st Century learners and provide evidence regarding how situated learning experiences will result in more advanced learning This Project Based Instruction PBI resource illustrates how to design and implement interdisciplinary project based units based on the REAL Realistic Explorations in Astronomical Learning Unit 1 and CREATES Chemical Reactions Engineered to Address Thermal Energy Situations Unit 2 The content of the book details these two PBI units with authentic student work explanations and research behind each lesson including misconceptions students might hold regarding STEM content pre post research results of unit implementation with over 40 teachers and thousands of students In addition to these two units there are chapters describing how to design one s own research based PBI units incorporating teacher commentaries regarding strategies obstacles overcome and successes as they designed and implemented their PBI units for the first time after learning how to create PBI STEM Environments the REAL way

Research in Education ,1974 *THE EDUCATIONAL TIMES, AND JOURNAL OF THE COLLEGE OF PRECEPTORS* C.F. HODGSON,1871 *The Educational Times and Journal of the College of Preceptors* ,1870 *Active Learning: Theoretical Perspectives, Empirical Studies and Design Profiles* Robert Cassidy,Elizabeth S. Charles,James D. Slotta,Nathaniel Lasry,2019-07-11 This book represents the emerging efforts of a growing international network of researchers and practitioners to promote the development and uptake of evidence based pedagogies in higher education at something a level approaching large scale impact By offering a communication venue that attracts and enhances much needed partnerships among practitioners and researchers in pedagogical innovation we aim to change the conversation and focus on how we work and learn together i e extending the implementation and knowledge of co design methods In this first edition of our Research Topic on Active Learning we highlight two of the three types of publications we wish to promote First are studies aimed at understanding the pedagogical designs developed by practitioners in their own practices by bringing to bear the theoretical lenses developed and tested in the education research community These types of studies constitute the practice pull that we see as a necessary counterbalance to knowledge push in a more productive pedagogical innovation ecosystem based on research practitioner partnerships Second are studies empirically examining the implementations of evidence based designs in naturalistic settings and under naturalistic conditions Interestingly the teams conducting these studies are already exemplars of partnerships between researchers and practitioners who are uniquely positioned as in between straddling the two worlds As a result these publications represent both the rigours of research and the pragmatism of reflective practice In forthcoming editions we will add to this collection a third type of publication design profiles These will present practitioner developed pedagogical designs at varying levels of abstraction to be held to scrutiny amongst

practitioners instructional designers and researchers alike We hope by bringing these types of studies together in an open access format that we may contribute to the development of new forms of practitioner researcher interactions that promote co design in pedagogical innovation

Graphical Analysis of Covering and Paired Domination in the Environment of Neutrosophic Information Sami Ullah Khan, Abdul Nasir, Naeem Jan, Zhen-Hua Ma, Neutrosophic graph NG is a powerful tool in graph theory which is capable of modeling many real life problems with uncertainty due to unclear varying and indeterminate information Meanwhile the fuzzy graphs FGs and intuitionistic fuzzy graphs IFGs may not handle these problems as efficiently as NGs It is difficult to model uncertainty due to imprecise information and vagueness in real world scenarios Many real life optimization problems are modeled and solved using the well known fuzzy graph theory **AAPT Announcer** American Association of Physics Teachers, 1987 **The United States Catalog Supplement, January 1918-June 1921** Eleanor E. Hawkins, 1921 **American Education** , 1967 **The Electrical Review** , 1927 *Telegraphic Journal and Electrical Review* , 1927 *Scientific American* , 1905 **The Journal of Education** , 1890 **Report Upon State Education in Great Britain, France, Switzerland, Italy, Germany, Belgium, and the United States of America** Richard Laishley, 1886 *Current Index to Journals in Education, Semi-Annual Cumulation, January-June, 1977* Educational Resources Information Center Staff, 1977-09

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$$\begin{pmatrix} 2 & 2 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 3 \\ 1 & 1 & 3 & 0 & 1 & 1 & 1 & 1 & 1 & 1 \end{pmatrix}$$
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web so there are two quantities which can be found in a matrix minors and cofactors minors exist for each element of the matrix and are defined as the determinant of the matrix you get when you ignore the row and column of the element in question for example if my matrix is as follows $\begin{vmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \end{vmatrix}$

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