



**DEPARTMENT OF EDUCATION  
REPUBLIC OF SOUTH AFRICA  
NATIONAL CERTIFICATE  
ELECTRO-TECHNOLOGY N3  
TIME: 3 HOURS  
MARKS: 100**

*April 07*

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**INSTRUCTIONS AND INFORMATION**

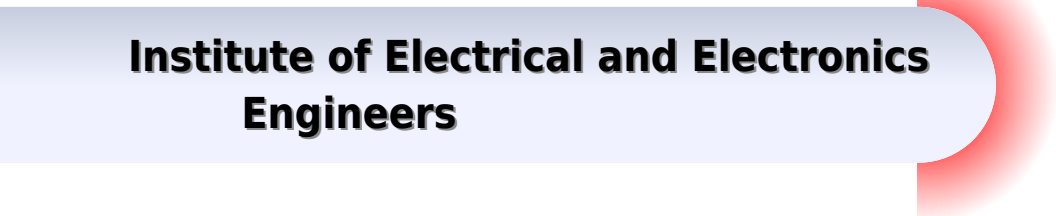
1. Answer ALL the questions.
  2. Full marks can be obtained by answering questions to the value of 100 marks correctly.
  3. Make sure to copy the correct information from the question paper and to substitute the correct value for the correct symbol.
  4. Number the answers clearly, correctly and keep the subsections of questions together, for example QUESTION 1.1, 1.2, 1.3 et cetera. Rule off on completion of each question.
  5. ALL the sketches and/or diagrams must be done in pencil. The sketches must be neat, reasonably large and fully labelled.
  6. Untidy and illegible work will be strictly penalised.
  7. Work the answers to THREE decimal numbers after the comma, for example 3,142.
  8. Use the correct units for answers.
- 

**QUESTION 1**

- |     |                                                                                                                                |             |
|-----|--------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1.1 | Briefly explain by means of neat, labelled circuit diagrams FOUR types of direct-current machines.                             | (8)         |
| 1.2 | State the type of material that is used mainly for brushes of a direct-current machine and motivate why that material is used. | (2)         |
|     |                                                                                                                                | <b>[10]</b> |

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Electronic Constitution: Social, Cultural, and Political Implications Amoretti, Francesco, 2009-03-31 Provides analysis of the relationship between digital information technologies and politics relating these issues to the historical system transformation

*Index to IEEE Publications* Institute of Electrical and Electronics Engineers, 1979 Issues for 1973 cover the entire IEEE technical literature

**Air and Missile Defense Systems Engineering** Warren J. Boord, John B. Hoffman, 2016-04-06 Air and Missile Defense Systems Engineering fills a need for those seeking insight into the design procedures of the air and missile defense system engineering process Specifically aimed at policy planners engineers researchers and consultants it presents a balanced approach to negating a target in both natural and electronic attack environmen

The New York Times Index, 2006

**Government Reports Announcements & Index**, 1975-06

*Encyclopedia of Algorithms* Ming-Yang Kao, 2008-08-06 One of Springer's renowned Major Reference Works this awesome achievement provides a comprehensive set of solutions to important algorithmic problems for students and researchers interested in quickly locating useful information This first edition of the reference focuses on high impact solutions from the most recent decade while later editions will widen the scope of the work All entries have been written by experts while links to Internet sites that outline their research work are provided The entries have all been peer reviewed This defining reference is published both in print and on line

**Intelligence and National Security** Loch K. Johnson, Loch J. Johnson, James J. Wirtz, 2008 The second edition of Johnson and Wirtz's anthology provides a comprehensive set of readings in the field of intelligence studies The book spans a wide range of topics from how the United States gathers and interprets information collected around the world to comparisons of the American intelligence system with the secret agencies of other nations The text addresses a wide range of material including 1 the meaning of strategic intelligence 2 methods of intelligence collection 3 intelligence analysis 4 the danger of intelligence politicization 5 relationships between intelligence officers and the policymakers they serve 6 covert action 7 counterintelligence 8 accountability and civil liberties 9 the implications of the major intelligence failures in 2001 and 2002 regarding respectively the terrorist attacks against the United States and the faulty estimates about weapons of mass destruction in Iraq and 10 intelligence as practiced in other nations New to this edition A review of the state of intelligence research literature An interview with former CIA director Richard Helms The early development of U S satellite surveillance The role of intelligence leaks in the federal government Improving relations between the producers and consumers of intelligence The Senate investigation of the Ames spying scandal in the CIA NSA warrantless wiretaps Intelligence mistakes leading up to the 9 11 attack Intelligence failures in the faulty predictions of WMDs in Iraq Institutional conflicts that contributed to 9 11 failures The British intelligence failures regarding WMDs in Iraq

*Electrotechnology N3* Tommy Ferreira, 2015

**N3 Electrotechnology**, 2018

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