



# **THE KENYA POLYTECHNIC**

**GRAPHIC ARTS DEPARTMENT**

**DIPLOMA IN PRINTING TECHNOLOGY**

**DIPLOMA IN GRAPHIC DESIGN**

**END OF YEAR I EXAMINATIONS**

**NOVEMBER 2006**

**SCIENCE**

**3 HOURS**

**INSTRUCTIONS TO CANDIDATES:**

Answer any FIVE questions.

All questions carry equal marks and the maximum marks for each part of a question are as shown.

**This paper consists of 3 printed pages.**

**© 2006, The Kenya Polytechnic Examinations Office**

---

1. (a) Explain the important roles played by science in printing. (12 marks)
- (b) Using examples show the roles played by science in printing with respect to:
  - (i) Improvements made to the types of materials used in production.
  - (ii) Changes in technologies employed during the actual print production exercises. (8 marks)
2. (a) Define the following terms:
 

(i) Inertia	(ii) Force
(iii) Friction	(iv) Scalar quantity
(v) Vector quantity	(10 marks)
- (b) State TWO advantages and TWO disadvantages of friction. (4 marks)
- (c) State THREE (Newton's) laws of motion. (6 marks)
3. (a) Explain the "transition elements". (5 marks)
- (b) Discuss using examples where possible the important role played by "transition elements" within the printing industry. (10 marks)
- (c) By using the aspect of "Electronic Configuration" of elements, show TWO instances where the transition elements exhibit their uniqueness and how this is reflected in the printing industry. (10 marks)
4. (a) State FOUR factors that affect electrical resistance of a conductor. (8 marks)
- (b) Differentiate between alternating and direct current with respect to electrical energy supply. (4 marks)
- (c) Define the following terms:
 

(i) Current	(ii) Voltage
(iii) Resistance	(iv) Electrical circuit
	(8 marks)
5. (a) Explain any THREE uses of:
  - (i) Ultra violet radiation (6 marks)
  - (ii) Infra red radiation (6 marks)
- (b) Explain how ultra violet and infra red rays may be detected. (4 marks)

(c) State TWO differences between the ultra violet and infra red rays.

(4 marks)

6. (a) Explain electrolysis.

(5 marks)

(b) Explain the following terms in relation to electrolysis:

(i) Cathode

(ii) Anode

(iii) Electrolyte

(iv) Current flow

(v) Electron flow

(15 marks)

7. (a) State the electrical energy power formula.

(2 marks)

(b) Show how:

(i) An existing relationship can be developed between the power formula and Ohm's law.

(12 marks)

(ii) The derived formula (for eventual power calculations) can be obtained from the developed relationship in 7(b)(i) above.

(6 marks)