



THE KENYA POLYTECHNIC

DEPARTMENT OF INSTITUTIONAL MANAGEMENT

DIPLOMA IN CLOTHING TECHNOLOGY

END OF YEAR I EXAMINATIONS

NOVEMBER 2006

APPLIED SCIENCE

3 HOURS

Instructions to candidates:

This paper consists of THREE sections, A, B and C.

Answer each section of a separate booklet.

This paper consists of 4 printed pages.

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SECTION A: MATHEMATICS

Answer any FIVE questions in this section.

1. Simplify the following:

(i) $\frac{2x}{3} + \frac{5y}{2}$ (5 marks) (ii) $\left(\frac{p-3}{6} - \frac{p-1}{10}\right)$ (5 marks)

2. (a) Divide 2.57 by 0.7, giving the answer correct to 3 decimal places. (2 marks)

(b) Arrange $\frac{1}{5}, \frac{2}{7}, 0.25$ and $\frac{3}{4}$ in ascending order and convert them into percentage. (8 marks)

3. Evaluate the following:

(i) $2 - \frac{2}{3} \text{ of } \left(\frac{1}{2} + \frac{2}{5}\right)$ (5 marks) (ii) $(3.01 - 2.39) \div 100$ (5 marks)

4. (a) Find the area and perimeter of a rectangular material which is 230m long and 80m wide. (5 marks)

(b) Find the H.C.M of 30, 75 and 165. (3 marks)

(c) Find the square root of 1764. (2 marks)

5. What is the average speed of an aircraft which flies to a place 100km away at 200km/h and returns at 300km/hr. (10 marks)

6. The catalogue price of an article is shs.250. This is subjected to a discount of 16% and the price when again reduced is subject to a further discount of 10%. What is the final price of the article? (10 marks)

7. David contributes shs.15000 and Peter shs.9000 in a business. David is a sleeping partner, Peter gets 10% of the profit for management and the rest of the profit is divided into the ratio of their capitals. If the profit is shs.4000, what is the share of each? (10 marks)

8. (a) Find the simple interest on shs.285 for $2\frac{1}{2}$ years at 8% per annum. (6 marks)

(b) Calculate also the amount after $2\frac{1}{2}$ years. (4 marks)

9. The scale of a map is 2cm to the kilometer. Find in hectares the area of an estate represented by an area 18cm^2 on the map. (10 marks)

SECTION B: PHYSICS

Answer any TWO questions from this section.

10. Explain the following terms:

- | | | |
|------------------|------------|-----------|
| (i) Length | (ii) Area | |
| (iii) Inches | (iv) Meter | |
| (v) Tape measure | | (5 marks) |

11. Briefly discuss electric-iron as one of the laundry appliances. (5 marks)

12. When an appliance suddenly stops working or the lights on one floor go out, this is a good indication that a fuse has blown. Give FIVE reasons why this has happened. (5 marks)

13. A room 7m long and 6.5m wide is to have the floor covered with carpet, which is sold in a roll 50cm wide. Find the total length of the carpet required. (5 marks)

SECTION B: CHEMISTRY

Answer any TWO questions from this section.

14. (a) Define the following terms using relevant examples:

- | | |
|----------------|--------------|
| (i) Molecule | (ii) Element |
| (iii) Compound | (iv) Atom |

(b) Differentiate between atomic mass and atomic number. (2 marks)

(c) State FOUR characteristics of each of the following:

- | | |
|-------------------------|-----------------------------|
| (i) Period (I) Elements | (ii) Group 0 and 8 elements |
|-------------------------|-----------------------------|

(d) Give TWO reasons why elements react. (1 marks)

15. (a) Discuss FOUR properties of:

- | | |
|-------------------------|-----------|
| (i) Ionic compounds | (4 marks) |
| (ii) Covalent compounds | (4 marks) |

(b) Draw the structures of the following atoms. Clearly show the number of neutrons, electrons and the electronic configuration. (10 marks)

- | | |
|-----------------------------|------------------------------|
| (i) ${}^{37}_{17}\text{Cl}$ | (ii) ${}^{35}_{17}\text{Cl}$ |
|-----------------------------|------------------------------|



(c) Giving examples, define the term "isotope". (1 mark)

16. (a) Discuss the characteristics of:

(i) Liquids (2 marks) (ii) Solids (2 marks)

(iii) Gases (2 marks)

(b) Name TWO types of hardness of water and describe what causes them. (4 marks)

(c) Discuss TWO advantages and TWO disadvantages of soapless detergents. (5 marks)