QUESTIONS CARRY THE MARKS INDICATED IN BRACKETS:

Where questions call for the production of sketches these need not be to scale but must be in proportion.

All sketches are to be fully annotated. Sketches may be produced in pencil or ink. All other written work must be in ink.

Students will be rewarded for neatness, clarity and adhering to the point.

THIS IS A CLOSED BOOK EXAMINATION AND NO REFERENCE MATERIAL IS PERMITTED

THIS PAPER CONSISTS OF 3 PAGES. PLEASE CHECK THAT ALL ARE INCLUDED

STUDENTS ARE TO ANSWER ALL QUESTIONS
QUESTION 1

a) Mechanical conveyors fall into 5 broad classes or types. Name four of these and briefly explain their operation and use. Use annotated sketches where appropriate. (8)

b) Write an explanation of the ‘Programmed Operation’ type of joint lift control. (6)

c) Write brief notes on the application of escalators, where they are likely to be used & their advantages and disadvantages. Draw a cross section through an escalator rising one floor showing its outline and how it sits within the building structure. (8)

TOTAL MARKS 22

QUESTION 2

a) Name four common causes of fire within buildings. (2)

b) For fires to start and maintain themselves what factors and/or items must be present. What are they? (3)

c) What type(s) of portable fire extinguisher(s) would you specify for the following rooms/spaces/uses and why?

   i) A small private library
   ii) A garage attached to a private house used for the restoration of vintage motor cars
   iii) A domestic kitchen for possible small cooking fires (6)

d) Describe an automatic sprinkler system for fire fighting. Explain where it would be used, its parts and any of its advantages and disadvantages. Also what modification would you apply if it were in a situation where the temperature is likely to drop below the freezing point of water? (10)

TOTAL MARKS 21

QUESTION 3

a) What is electricity? Explain. (2)

b) Name three methods of generating electricity. (4)

c) Explain the difference between alternating current and direct current. Name a method of generating each of these. (4)
d) What do the following electrical units express:
   i) Watts  
   ii) Amperes  
   iii) Ohms  
   iv) Volts  
   v) Hertz
   (5)

e) Draw a safe electrical circuit.  
   (2)
f) What does MCB stand for in electricity supply?  
   (1)
g) What is the purpose of an Earth Leakage System?  
   (2)
h) In terms of the units in Question 3(d) above what electricity is used for normal domestic supply in Durban?  
   (4)

**TOTAL MARKS 24**

**QUESTION 4**

a) Illustrate a fully vented 'one pipe' drainage system suitable for a ground plus two floor building. The system serves both soil (wc's) and waste fittings (Baths and wash hand basins). Annotate fully and supply pipes diameters.  
   (6)
b) What is gradient or fall in drain design? How it expressed and what is the minimum gradient for a 100mm diameter sewer?  
   (4)
c) A number of factors must be considered and be present in good drain/sewer design. (Approx. 10 are mentioned in the notes) Name and then explain the purpose of six of these.  
   (12)
d) What is the minimum diameter for a public sewer?  
   (1)

**TOTAL MARKS 23**

**QUESTION 5**

a) Explain the process of purifying water to make it potable.  
   (3)
b) Explain 'relative humidity'  
   (2)
c) Draw a diagram (section) through a building showing how it exchanges heat with its internal and external environment.  
   (5)

**TOTAL MARKS 10**