

3.22.2 Drawing and Design Paper 2 (449/2)

DESIGN PROBLEM (40 marks)

The less fortunate Kenyans living in the arid and semi-arid area largely depend on water from deep wells for their domestic use. Some end up hurting their backs as they struggle to pull water from the wells manually.

Design a manually operated machine that can be of help to these people, considering the following:

- 1 It should be operated by the person standing in the upright position.
2. It should be operated with minimum effort.
3. It should have an automatic braking system that can stop the container from moving backwards, unless when necessary.
4. It should be adjustable to enable use of less effort.
5. It should have a container that scoops the water with minimum delay.

REQUIREMENTS

- (a) Make free hand sketches of two possible solutions for the design. (6 marks)
- (b) Select **one** of the designs in (a) above and make a refined labelled pictorial sketch. (12 marks)
- (c) Make detailed sketches of the mechanisms or features used in considerations (2) to (5) above. (14 marks)
- (d) List **three** materials to be used and give one reason for the choice of each. (6 marks)
- (e) List **four** methods to be used in joining the parts. (2 marks)

