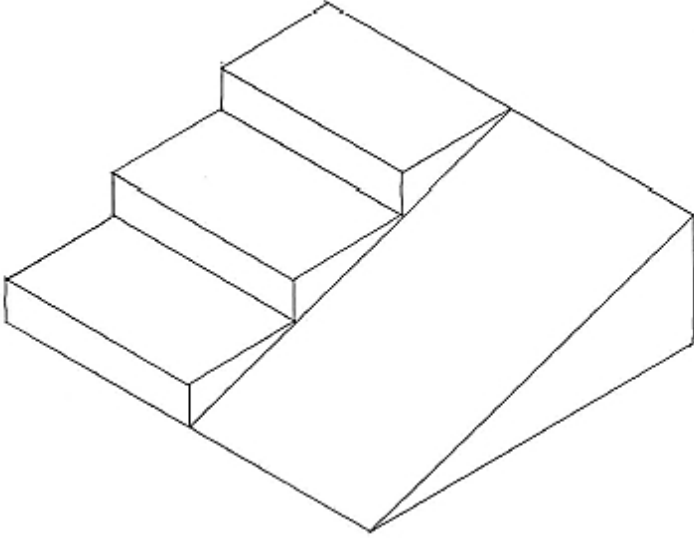# RAMOTSHERE MOILOA SUB-DISTRICT

GRADE 9

**TECHNOLOGY**

**JUNE 2019
MEMORANDUM**

**This memorandum consists of 7 pages.**
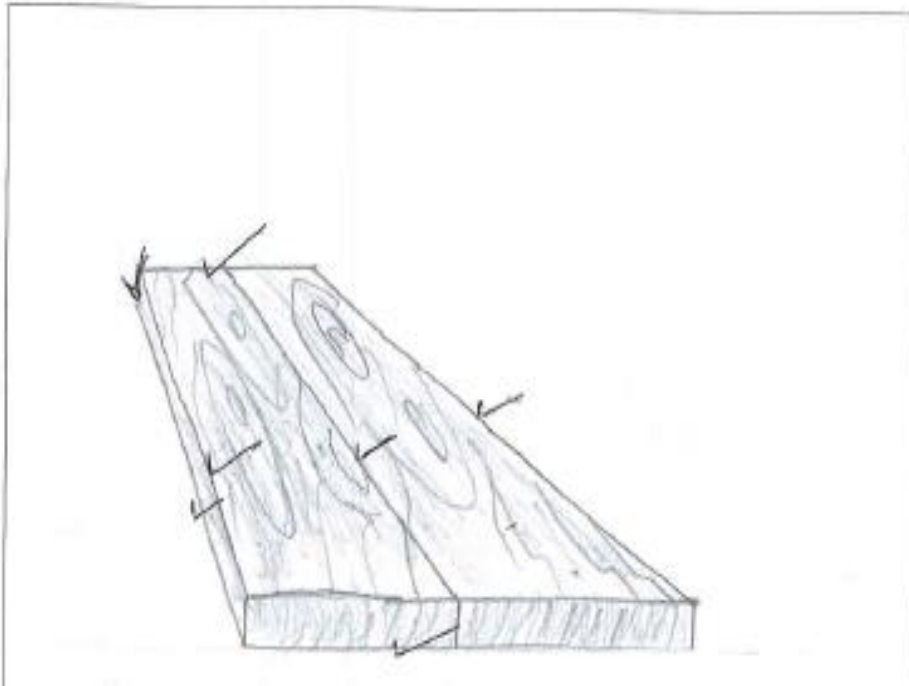
| | Question 1 | |
|---|---|---|
| 1.1 | | |
| 1.1.1 | D√ | 1 |
| 1.1.2 | C√ | 1 |
| 1.1.3 | B√ | 1 |
| 1.1.4 | D√ | 1 |
| 1.1.5 | D√ | 1 |
| 1.1.6 | A√ | 1 |
| 1.1.7 | B√ | 1 |
| 1.1.8 | D√ | 1 |
| 1.1.9 | B√ | 1 |
| 1.1.10 | D√ | 1 |
| | | **10** |
| 1.2 | | |
| 1.2.1 | True √ | 1 |
| 1.2.2 | True √ | 1 |
| 1.2.3 | False √ | 1 |
| 1.2.4 | True √ | 1 |
| 1.2.5 | False√ | 1 |
| | | **5** |
| 1.3 | | |
| 1.3.1 | D √ | 1 |
| 1.3.2 | E √ | 1 |
| 1.3.3 | B √ | 1 |
| 1.3.4 | C √ | 1 |
| 1.3.5 | A √ | 1 |
| | **[20]** | **5** |
| | **QUESTION 2** | |
| 2.1 | | 1 |
| 2.1.1 | Hardness: Materials that withstand being cut, scratched or dented.√ | 1 |
| 2.1.2 | Stiffness: Materials that resist deformation by bending.√ | 1 |
| 2.1.3 | Flexibility: Materials that bends easily, but returns to its original shape.√ | 1 |
| 2.1.4 | Corrosion resistance: The ability of a material to resist being corroded or rusted.√ | 1 |
| 2.15 | Ductility: The ability of a material to stretch.√ | 1 |
| | | **5** |
| | | |
| 2.2 | Even load: It exerts an equal force over the whole structure that supports it.√ | 1 |
| | Uneven load: A load that mainly exerts a force on one part of a structure that supports it.√ | 1 |
| 2.3 | | |
| 2.3.1 | Bending√ | 1 |
| 2.3.2 | Tension√ | 1 |
| 2.3.3 | Torsion√ | 1 |
| 2.3.4 | Compression√ | 1 |
| 2.3.5 | Shear√ | 1 |
| | **[12]** | **5** |
| | | |
| | | |
| | | |

| | | QUESTION 3 | |
|---|---|---|---|
| 3.1 | | Design and make a combined and ramp√ √ | 2 |
| 3.2 | | 

**Possible answer for the free hand sketch** | 9 |

| Skills | Description | Marks Allocated |
|---|---|---|
| Free hand sketches (maximum = 9 marks for the entire question) | It is evident from the sketch that it is a solution to the problem identified. | (4) |
| | The view is complete and | (3) |
| | All dimensions written in | (2) |

| | | | |
|---|---|---|---|
| 3.3 | | (a) The example shows 2 steps instead of 3√ | 1 |
| | | (b) The length of the base shows 2400mm instead of 1800 mm√ | 1 |
| | | (c) The width of the stairs shows 1200 mm instead of 1000 mm√ | 1 |
| | | | |
| | | **[14]** | |

|  |  |  |
|---|---|---|
|  | **QUESTION 4** |  |
| 4 |  |  |
| 4.1 | Hydraulic use liquid such as oil and water.√ |  |
|  | Pneumatic use compressed air/ gas. √ | 2 |
| 4.2 | The pressure on the hand will be smaller with the pneumatic system, because part of the work done to press the plunger is spent on compressing the air and is therefore not available at the output end. | 3 |
| 4.3 | It is incompressible, it is a good lubricant √ √ | 2 |
| 4.4 | The first rule of hydraulics states that when one piston in a hydraulic system is moved then the second piston will move too. √ √ √ | 3 |
| 4.5 | In a hydraulic or pneumatic system, pressure exerted on one part of the system will be transferred equally to other parts of the system. √ √ √ | 3 |
|  | **[13]** |  |
|  | **Question 5** |  |
|  |  |  |
| 5.1 | A hydraulic system contains two or more containers connected by tubes. The system is filled with hydraulic fluid, such as oil or water. When the piston in one container moves, then the piston in the other container move as well. √ √ | 2 |
|  |  |  |

| 5.2 | Person pushes and pulls the handle of the jack up and down. √ √ | The one way valve is forced to open and oil lifts the output piston. √ √ | The jack lifts the car or the load. √ √ | 6 |
|---|---|---|---|---|
|  |  |  |  |  |

|  |  |  |
|---|---|---|
| 5.3 | Ma =Load/Effort √          2500kg x 10= 25000 N √<br>    =2500 N / 500 N√<br>    = 5 √ | 4 |
|  | **[12]** |  |
|  | **Question 6** |  |
|  |  |  |
| 6.1 |  |  |
| 6.1.1 | A pulley is a grooved wheel that performs a similar function to a gear. √ | 1 |
| 6.1.2 | A compound pulley system is when a pulley has more than one pulley working together to provide mechanical advantage. √ | 1 |
|  |  |  |
| 6.1.3 | A person can pull down on a rope to lift a load, instead of trying to lift a load up. Pulleys create a mechanical advantage to make work easier. √√ | 2 |
| 6.2 |  |  |
| 6.2.1 | MA = Load/effort√<br>    = 500N/250N√<br>    = 2 √ | 3 |
|  | **[7]** |  |
|  |  |  |
| 7.1 | **Question 7** |  |
| 7.1.1 | A-Pawl√ | 1 |
|  | B- Ratchet √ | 1 |
|  | C-Crack hand√ | 1 |
| 7.1.2 | To turn the ratchet axle √ | 1 |

| 7.1.3 | Ma = Load/Effort√ <br>    = 600N/150N√ <br>     = 4 √ | 3 |
|-------|------------------------------------------------------------------------|---|
| 7.1.4 | A. Ratchet and Pawl: Winch √ <br> B. Cleat: On a sail boat to hold a rope from sails, Blinds √ <br> C. One-way valve: Tube in a bicycle tyre. √ | 3 |
| | **[10]** | |
| | | |
| | **Question 8** | |
| 8. | | |
| 8.1 | Gear ratio = No of teeth of the driven gear/No of the teeth driver gear√ <br>      = 75/15√ <br>      = 5:1 √ | 3 |
| 8.2 | Decreasing√ , Gear B (driven) rotates once when gear A (driver) rotates five times.√ | 2 |
| 8.3 | Gear B will rotate five times √ √ | 2 |
| 8.4 | Anticlockwise √ | 1 |
| 8.5 | An idler gear√, must be placed between the driver and driven√ | 2 |
| | | |
| | **[10]** | |
| | | |
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**QUESTION 9**
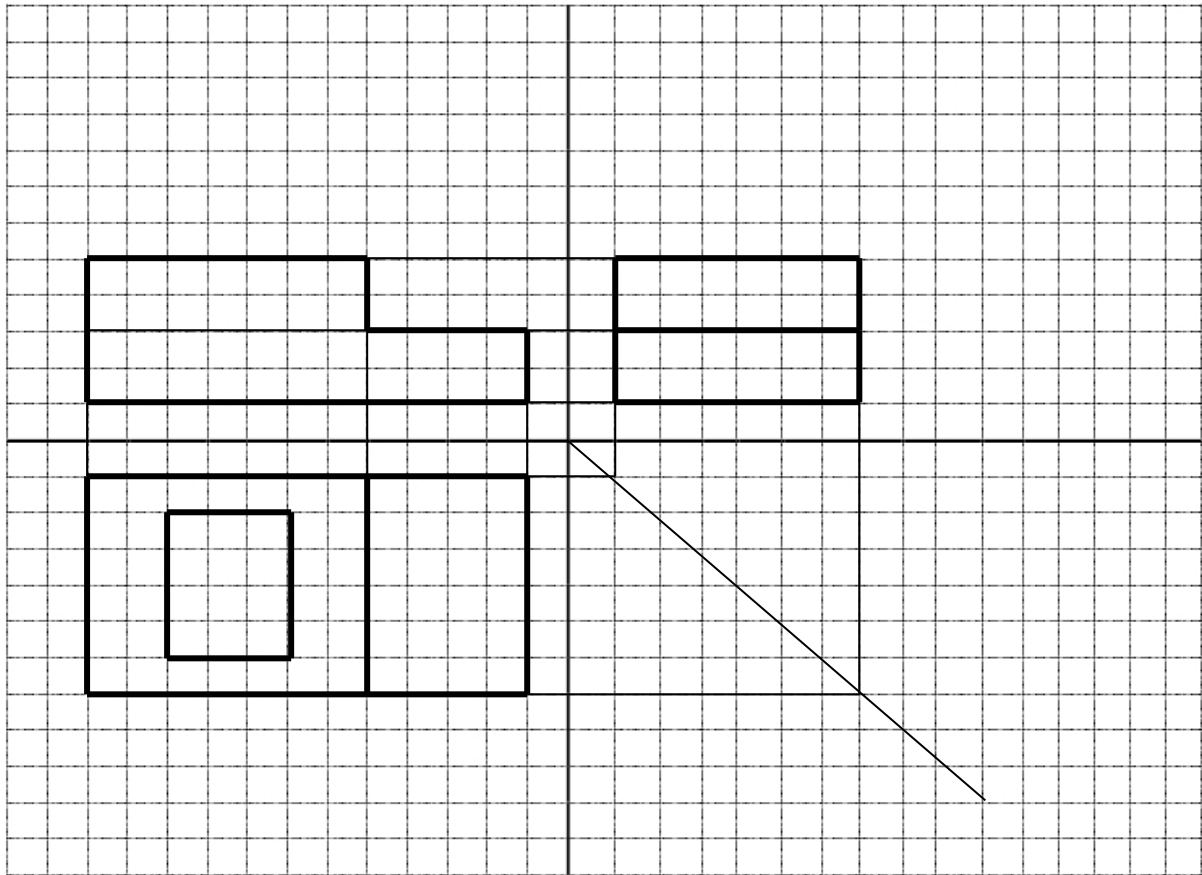


Single point drawing                  = 6 marks

     Shading & texture                  = 1 marks
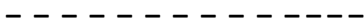
     Wood texture                      = 1mark

   **The vanishing point may be placed at any position**

**QUESTION 10.1**

**QUESTION 10.2**

| LINE DRAWING | NAME | DESCRIPTION/PROPERTY |
|---|---|---|
| ▬▬▬▬▬▬▬▬▬ | Outline √ | Thick and continuous √ |
| – – – – – – – – – – – | Hidden details √ | Feint dashed line √ |
| ←————————→ | Dimension √ | Thin with arrows on either side √ (6) |

**GRAND TOTAL: 120 MARKS**