



National 5  
Coursework  
Assessment Task



# National 5 Engineering Science Assignment

## Worksheets: Leisure pool complex

Valid for session 2024-25 only.

**This is given to centres in strictest confidence. You must keep it in a secure place until it is used.**

This edition: January 2025 (version 1.0)

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# Introduction

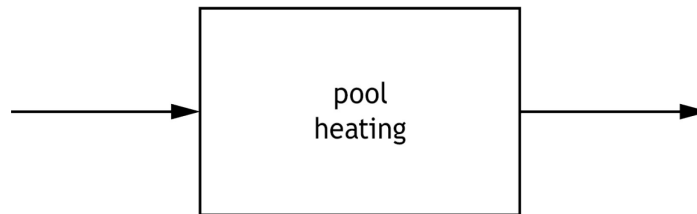
This document contains worksheets for candidates to use for the current National 5 Engineering Science assignment. They must be used in conjunction with the assignment document.

## Instructions for candidates

This document contains the worksheets that you need for the current assignment. The assignment document tells you when you need to use a worksheet. The worksheets must be completed single-sided, with nothing written on the back.

Anything you handwrite or draw must be in blue or black permanent ink only.

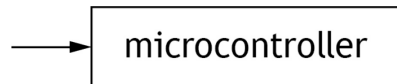
## Task 1a(i) – worksheet 1a(i)



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## Task 1a(ii) – worksheet 1a(ii)

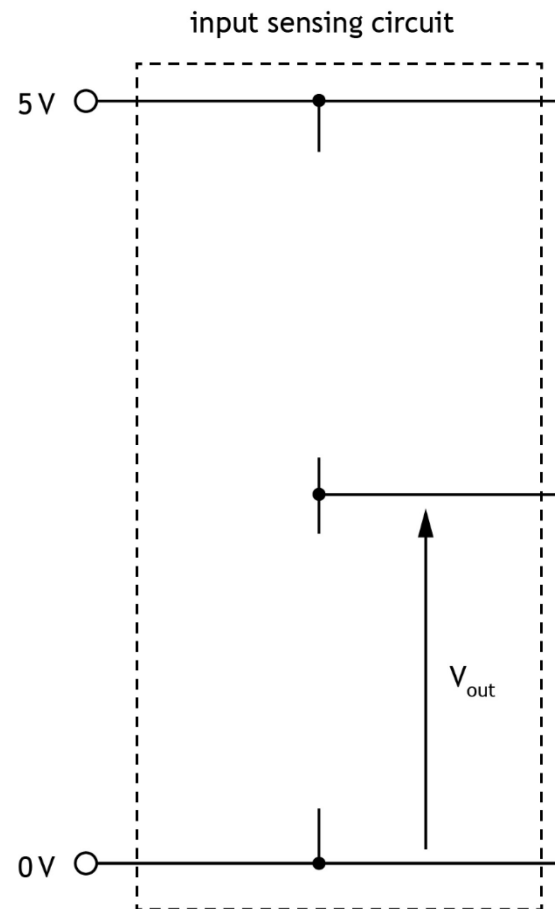


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## Task 1b – worksheet 1b

You must not construct or use simulation software to complete this task.



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## Task 1c – worksheet 1c

| Planned test                            | Expected result |
|-----------------------------------------|-----------------|
| Test 1<br>Reduce the water temperature. |                 |
| Planned test                            | Expected result |
| Test 2                                  |                 |

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## Task 2b — worksheet 2b

| Planned test                                                                                                                                            | Expected result                                                      | Initial test result                              | Planned amendment to circuit/flowchart | Re-test result                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------|----------------------------------------|--------------------------------------------------|
| <b>Test 1</b><br>Press and hold the start switch (input 1) for a few seconds and then release it.                                                       | The LED flashes and the buzzer sounds 5 times.                       | <i>When the start switch is pressed ...</i>      |                                        | <i>When the start switch is pressed ...</i>      |
| Planned test                                                                                                                                            | Expected result                                                      | Initial test result                              | Planned amendment to circuit/flowchart | Re-test result                                   |
| <b>Test 2</b><br>After the LED and buzzer warning cycle has completed, press and hold the start switch (input 1) for a few seconds and then release it. | The relay switches on then the motor starts to turn.                 | <i>When the start switch is pressed again...</i> |                                        | <i>When the start switch is pressed again...</i> |
| Planned test                                                                                                                                            | Expected result                                                      | Initial test result                              | Planned amendment to circuit/flowchart | Re-test result                                   |
| <b>Test 3</b><br>When the motor is turning, press and hold the stop switch (input 3) for a few seconds and then release it.                             | The relay switches off and the motor gradually slows down and stops. | <i>When the stop switch is pressed...</i>        |                                        | <i>When the stop switch is pressed...</i>        |

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## Task 2d – worksheet 2d

|                                                   |  |
|---------------------------------------------------|--|
| <b>Improvement that will benefit the operator</b> |  |
| <b>Justification</b>                              |  |

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## Task 3b – worksheet 3b

| Planned test 1                                                  | Input direction | Output direction |
|-----------------------------------------------------------------|-----------------|------------------|
| Observe and record the direction of the input and output gears. |                 |                  |

| Planned test 2                                                                                                                                 | Input speed/turns | Output speed/turns | Actual Velocity Ratio |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|-----------------------|
| Measure the input speed (or number of turns) and output speed (or number of turns) of the gear system and calculate the actual velocity ratio. |                   |                    |                       |

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## Task 3c – worksheet 3c

| Specification point | Met? Yes/No | Justification |
|---------------------|-------------|---------------|
| i.                  |             |               |
| ii.                 |             |               |

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## Task 3d – worksheet 3d

You must not construct or use simulation software to complete this task.

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## Task 4a – worksheet 4a

You must not construct or use simulation software to complete this task.

S ○ —

D ○ —

—○ P

M ○ —

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## Task 4c – worksheet 4c

| S | D | M | P |
|---|---|---|---|
| 0 | 0 | 0 |   |
| 0 | 0 | 1 |   |
| 0 | 1 | 0 |   |
| 0 | 1 | 1 |   |
| 1 | 0 | 0 |   |
| 1 | 0 | 1 |   |
| 1 | 1 | 0 |   |
| 1 | 1 | 1 |   |

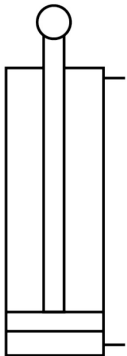
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## Task 5b – worksheet 5b

pool  
floor  
up

pool  
floor  
down



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## Task 5c – worksheet 5c

|               |  |
|---------------|--|
| Modification  |  |
| Justification |  |

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# Administrative information

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## History of changes

| Version | Description of change | Date |
|---------|-----------------------|------|
|         |                       |      |
|         |                       |      |
|         |                       |      |
|         |                       |      |

## Security and confidentiality

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