

# Practice Assessment

## Utilities Engineering Technician

Please write clearly in block capitals below	
Company name	
First name (s)	
Last name (s)	
Date of birth	
Apprentice signature	
Date of knowledge test	

**Level: 3**  
**Standard: Utilities Engineering Technician**  
**Pathway: Instrumentation Control and Automation**  
**Duration: 1 hour**

### Materials

For this paper you must have:

- Pens
- Scientific calculator (non-programmable)

### Instructions

- Use black ink or black ball-point pen
- Fill in the boxes at the top of this page
- Answer **all** questions
- There are questions, possible answers as well as a column for you to mark your answer
- Mark your answer with an  against the possible answer you think is correct- if you wish to change your answer please put a line through  and re-select with another

- Only one answer per question allowed. Answers which do not follow the rules of selection will be disallowed. This may impact on the grade awarded
- Do all rough work in this answer book

### Below is a Sample:

London is the capital of....

Example Question		
London is the capital of...		
Possible answers		Answer
a)	Wales	<b>X</b>
b)	Scotland	
c)	Northern Ireland	
d)	England	<b>X</b>

### Information

- There are 40 questions
- The pass mark is 28
- All questions should be attempted

### Advice

- Do not spend too long on one question
- Read all questions thoroughly before starting your examination
- Mobile phones and watches must not be taken into the examination room. The examination must be conducted under examination conditions
- Cheating: you will be asked to leave the examination room and will be classified an automatic failure and referred to your employer

**THIS PAPER MUST NOT BE COPIED OR CIRCULATED WITHOUT THE WRITTEN PERMISSION OF THE EUIAS**

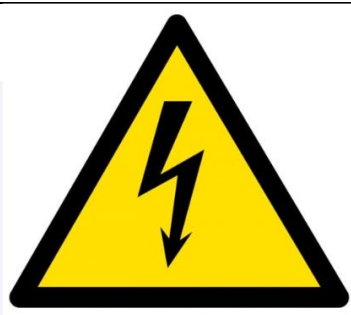
**Do not turn over the page or commence the knowledge test until the invigilator instructs you to**



Question 1		
How regularly should electrical safety equipment be inspected?		
Possible answers		Answer
a)	Daily	
b)	Weekly	
c)	Monthly	
d)	Prior to use	

Question 2		
What procedure is used to inform employees about health and safety?		
Possible answers		Answer
a)	Risk assessment	
b)	Isolation	
c)	Toolbox talk	
d)	Site audit	

Question 3		
What type of safety sign is shown below?		
Possible answers		Answer
a)	Mandatory	
b)	Warning	
c)	Prohibition	
d)	Emergency	



<b>Question 4</b>		
According to Health, Safety and Environment (HSE) guidelines which ONE of the following controls is the least effective?		
<b>Possible answers</b>		<b>Answer</b>
a)	Elimination	
b)	Engineering	
c)	PPE	
d)	Substitution	

<b>Question 5</b>		
What is the first action that should be taken when assessing a potentially hazardous substance?		
<b>Possible answers</b>		<b>Answer</b>
a)	Provide appropriate PPE (Personal and Protective Equipment)	
b)	Check the MSDS (Material Safety Data Sheet)	
c)	Check that there is space to store it safely	
d)	Conduct a risk assessment	

<b>Question 6</b>		
State ONE purpose of completing a Control of Substances Hazardous to Health Regulations (COSHH) assessment in the workplace.		
<b>Possible answers</b>		<b>Answer</b>
a)	To decide how heavy chemical containers are	
b)	To collect information about employees' health	
c)	To decide how often to check chemical stock levels for re-ordering	
d)	To identify the potential for exposure to harmful substances	

### Question 7

A gas test has been completed within a confined space. Which oxygen reading would allow safe entry into the confined space?

#### Possible answers


a)	19.5% - 23.5%	
b)	14% - 19%	
c)	6% - 14%	
d)	< 6%	

### Question 8

What does this green sign mean?

#### Possible answers

#### Answer

a)	Prohibited behaviour		
b)	Warning		
c)	Mandatory behaviour		
d)	Information		

### Question 9

Which ONE of the following regulations provide guidance on the use of handheld tools?

#### Possible answers

#### Answer

a)	Control of Substances Hazardous to Health (COSHH)	
b)	Provision and Use of Work Equipment Regulations 1998 (PUWER)	
c)	Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)	
d)	Control of Major Accident Hazards Regulations 2015 (COMAH)	

<b>Question 10</b>		
Which ONE of the following is commonly classed as safety-critical?		
<b>Possible answers</b>		<b>Answer</b>
a)	Fuse	
b)	Control valve	
c)	Steam trap	
d)	Drain valve	

<b>Question 11</b>		
In accordance with Health and Safety Executive (HSE) guidelines, which ONE of the following apply isolations?		
<b>Possible answers</b>		<b>Answer</b>
a)	Experienced people	
b)	Skilled people	
c)	Lead technicians	
d)	Authorised people	

<b>Question 12</b>		
In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?		
<b>Possible answers</b>		<b>Answer</b>
a)	The substance will give off a strong odour	
b)	The substance will have a label identifying the hazard	
c)	The substance will be contained in a glass receptacle	
d)	The substance will be in a red container	

<b>Question 13</b>		
What type of information is provided on the coloured tag on a piece of rigging equipment?		
<b>Possible answers</b>		<b>Answer</b>
a)	Certification period	
b)	Safe working load	
c)	Maximum working load	
d)	Safe to use	

<b>Question 14</b>		
What type of document should be fixed to a scaffold before use?		
<b>Possible answers</b>		<b>Answer</b>
a)	Risk assessment	
b)	Safety certificate	
c)	Permit to work	
d)	Approved Scafftag	

<b>Question 15</b>		
Which ONE of the following must be tested before entering a confined space?		
<b>Possible answers</b>		<b>Answer</b>
a)	Number of people wanting access	
b)	Oxygen content	
c)	Size of area	
d)	Noise levels	



<b>Question 16</b>		
When working in these locations which one does NOT require a Confined Space Entry Permit?		
<b>Possible answers</b>		<b>Answer</b>
a)	Refrigeration Unit	
b)	Trench	
c)	Vessel	
d)	Ceiling Void	

<b>Question 17</b>		
An operative is asked to carry out a task that will create dust.		
What will they need to do?		
<b>Possible answers</b>		<b>Answer</b>
a)	Dust is not a hazardous substance, so no safety measures are required	
b)	Wait until the wind is strong so it will blow the dust away	
c)	Wear the PPE identified on the permit or risk assessment	
d)	Only work for short periods and take regular breaks	

<b>Question 18</b>		
Which ONE of the following manual handling statements is true?		
<b>Possible answers</b>		<b>Answer</b>
a)	Correct manual handling prevents all accidents	
b)	Correct manual handling prevents damage to equipment	
c)	Correct manual handling should only be applied in the workplace	
d)	Correct manual handling reduces the risk of human injury	

<b>Question 19</b>		
What is the correct order of working at height control measures?		
<b>Possible answers</b>		<b>Answer</b>
a)	<ol style="list-style-type: none"> <li>1. Fall prevention</li> <li>2. personal fall protection</li> <li>3. avoid work at height</li> <li>4. collective fall protection</li> </ol>	
b)	<ol style="list-style-type: none"> <li>1. Avoid work at height</li> <li>2. fall prevention</li> <li>3. collective fall protection</li> <li>4. personal fall protection</li> </ol>	
c)	<ol style="list-style-type: none"> <li>1. Avoid work at height</li> <li>2. collective fall protection</li> <li>3. fall prevention</li> <li>4. personal fall protection</li> </ol>	
d)	<ol style="list-style-type: none"> <li>1. Personal fall protection</li> <li>2. collective fall protection</li> <li>3. fall prevention</li> <li>4. avoid work at height</li> </ol>	

<b>Question 20</b>		
Assuming an emergency shower is close by, what should a technician do if they come into contact with hazardous substances whilst wearing a protective suit?		
<b>Possible answers</b>		<b>Answer</b>
a)	Remove all clothing and douse down under the shower	
b)	Stand under the shower immediately and douse down under the shower	
c)	Complete the task and then douse down under the shower	
d)	Stop work and immediately report to the first aid room	

**Question 21**

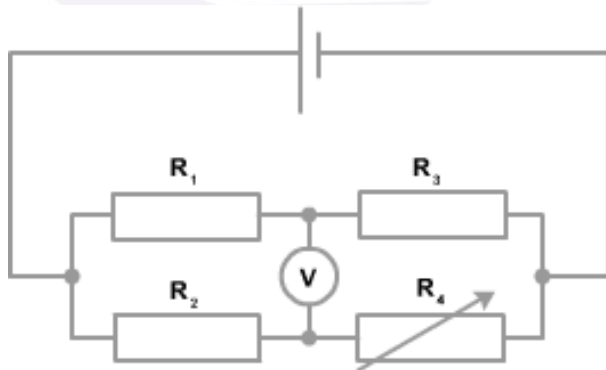
Which ONE of the following definitions best fits the terminology 'specification'?

Possible answers		Answer
a)	The capacity to withstand continuous force	
b)	The standard when measured against another object of similar design	
c)	A detailed description of the design and materials of an object	
d)	The specified point beyond which certification is invalid	

**Question 22**

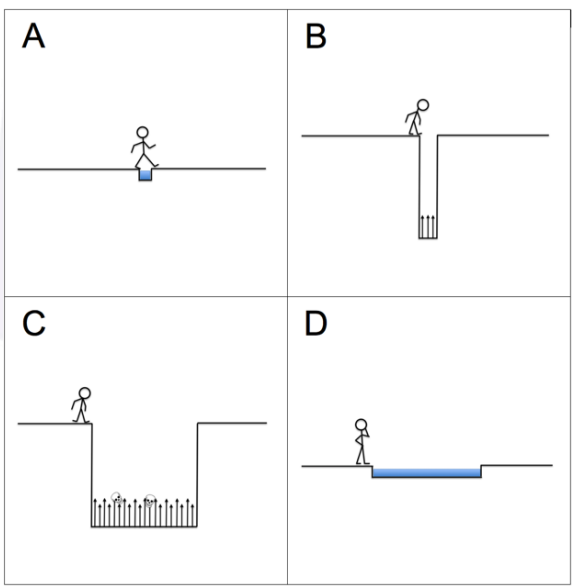
In the image below the bridge circuit is balanced.

If  $R_1 = 200 \Omega$ ,  $R_2 = 550 \Omega$  and  $R_4 = 100 \Omega$ , what is the value of  $R_3$ ?



Possible answers		Answer
a)	2000 $\Omega$	
b)	500 $\Omega$	
c)	450 $\Omega$	
d)	250 $\Omega$	

Question 23		
What is the formula for Ohms law?		
Possible answers		Answer
a)	$I = R \times V$	
b)	$I = R \div V$	
c)	$I = V \div R$	
d)	$I = V \times R$	

Question 24		
Looking at the image provided and taking into consideration risk, which task is low probability and low in impact?		
Possible answers	Answer	
a) A		
b) B		
c) C		
d) D		

### Question 25

A technician is working on a flow transmitter with a linear feedback signal of 4-20 mA. The transmitter has a range of 0-1600 L/per min. The measured feedback signal is 14 mA.

What is the flow rate?

Possible answers		Answer
a)	1400 L/per min	
b)	1200 L/per min	
c)	1000 L/per min	
d)	800 L/per min	

### Question 26

An operative is working on a 4-20 mA pressure transmitter with a working range of 0-160 mbar. The pressure is set at 100 mbar.

What would the expected feedback signal be?

Possible answers		Answer
a)	14 mA	
b)	12 mA	
c)	10 mA	
d)	8 mA	

### Question 27

Which device measures a change in process conditions?


Possible answers		Answer
a)	Sensor	
b)	Microprocessor	
c)	PLC (programmable logic controller)	
d)	Convertor	

<b>Question 28</b>		
What is the most common output range of a pneumatic transmitter?		
<b>Possible answers</b>		<b>Answer</b>
a)	0 to 1.9 bar	
b)	0 to 15 bar	
c)	0.2 to 1.0 bar	
d)	2 to 20 bar	

<b>Question 29</b>		
In a control system, what does the transducer do?		
<b>Possible answers</b>		<b>Answer</b>
a)	Changes a digital signal to a data packet	
b)	Converts a physical measurement into an electrical signal	
c)	Stores information and sends it to the site Supervisory Control and Data Acquisition (SCADA) system	
d)	Enables the equipment to work on 110V or 230V input voltages	

<b>Question 30</b>		
What is the metric SI (International System of Units) unit for torque?		
<b>Possible answers</b>		<b>Answer</b>
a)	Mn	
b)	Nm	
c)	Tq	
d)	N	

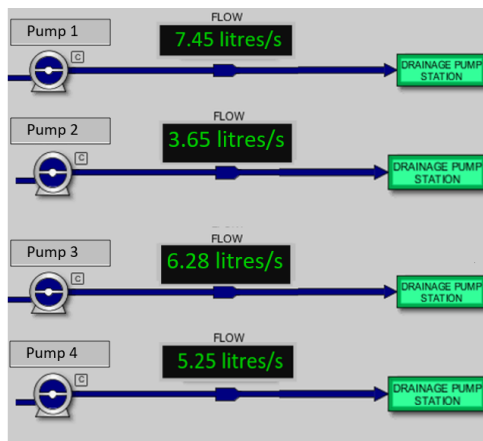
Question 31		
What type of maintenance is root cause analysis?		
Possible answers		Answer
a)	Preventative	
b)	Reflective	
c)	Planned	
d)	Reactive	

Question 32		
What does the symbol below represent when seen on a British Standard convention drawing?		
		
Possible answers		Answer
a)	Electrical signal	
b)	Instrument signal	
c)	Hydraulic line	
d)	Pneumatic line	

### Question 33

Refer to the diagram below.

Calculate the difference between the flow rates of pump 1 and pump 4.



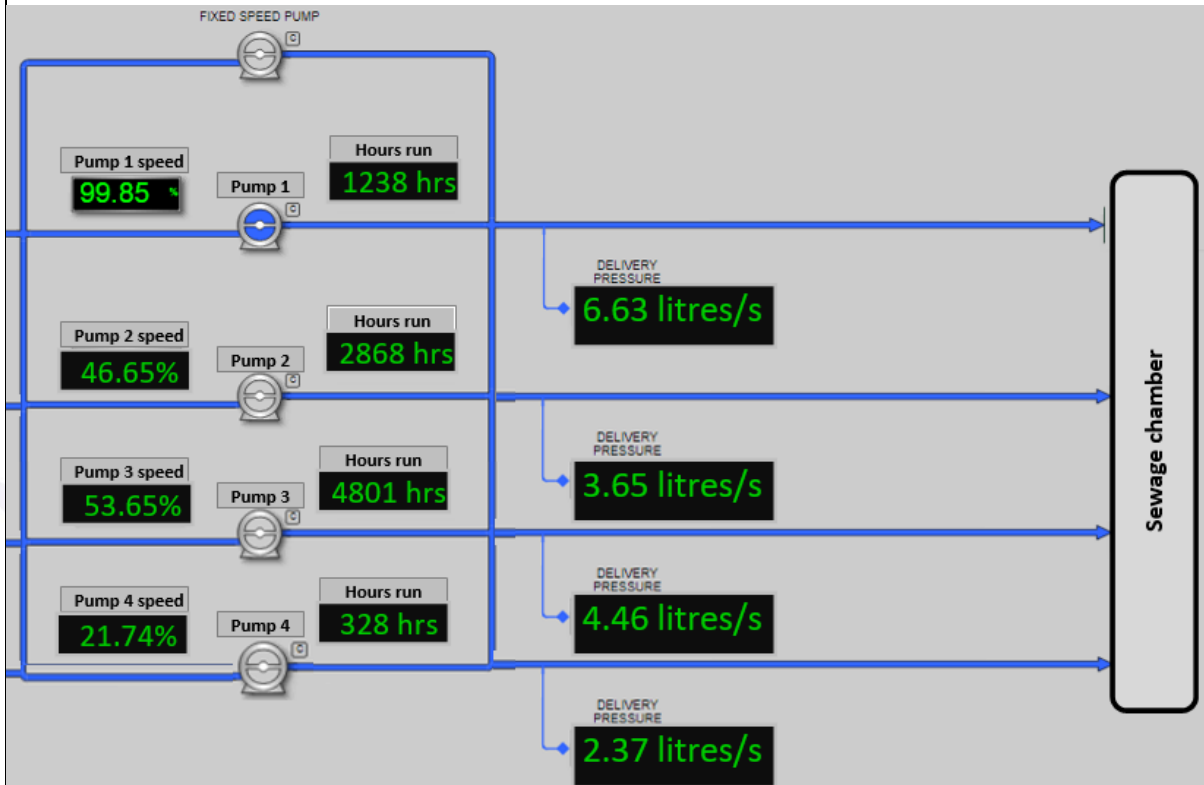
Possible answers		Answer
a)	2.05 litres per second	
b)	2.20 litres per second	
c)	2.25 litres per second	
d)	3.25 litres per second	



### Question 34

Refer to the display below.

Identify the average hours run time on the pump sets.



#### Possible answers

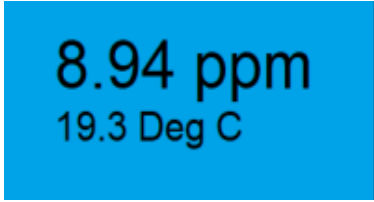
#### Answer

a)	3196.00 hours	
b)	2308.80 hours	
c)	55.47 hours	
d)	4.27 hours	

**Question 35**

Refer to the image below.

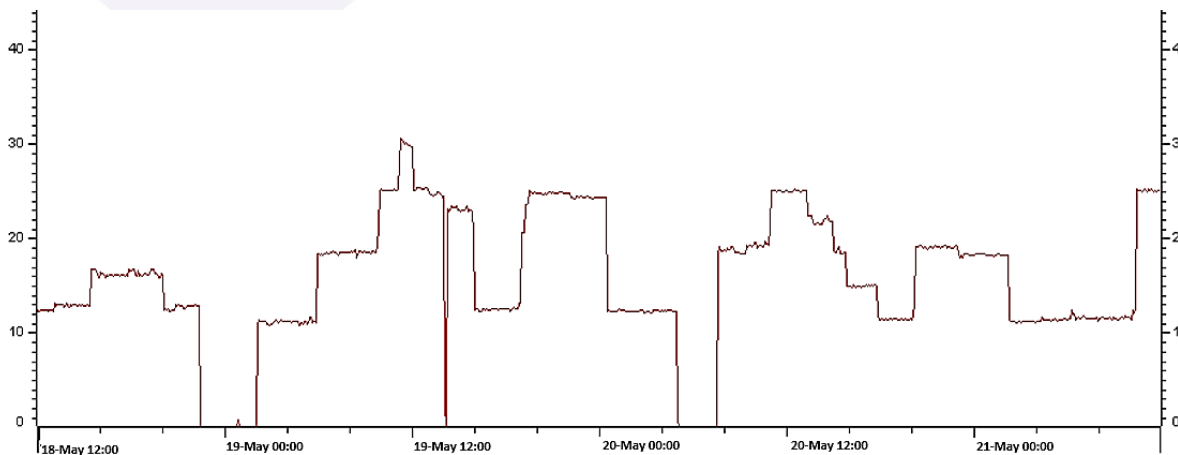
Which ONE of the following instruments would display this information?

Possible answers		Answer
a)	Dissolved oxygen analyser	
b)	Temperature transmitter	
c)	Human Machine Interface	
d)	pH probe	

**Question 36**

Refer to the trend analysis snapshot below of a pumping station.

On what day did the maximum flow rate occur?



Possible answers		Answer
a)	18 May	
b)	19 May	
c)	20 May	
d)	21 May	

**Question 37**

Refer to the image below.

What measurement is the reading displaying?

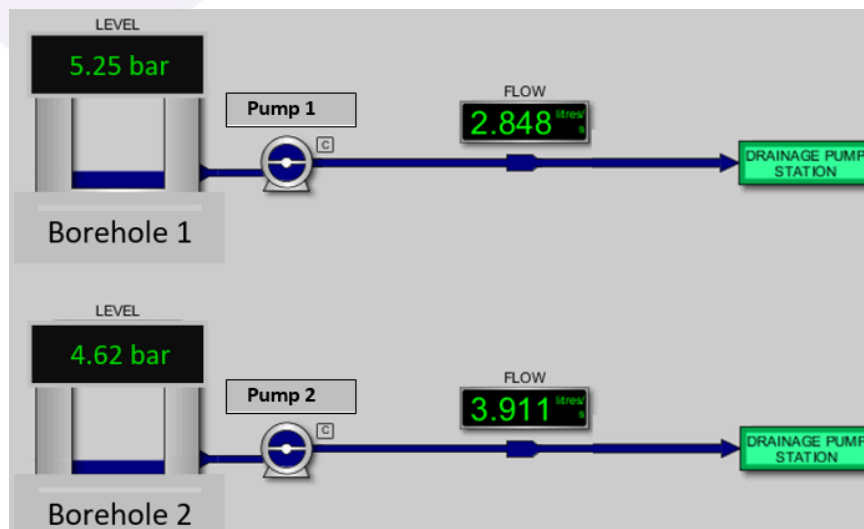
Possible answers		Answer
a)	Signal velocity	
b)	Viscosity of a liquid	
c)	Capacitance Probe (RF)	
d)	Turbidity	

1.84 NTU

**Question 38**

Refer to the display below.

If 1.0 bar of pressure equals approximately 10.1972 mH<sub>2</sub>O, what is the current level in mH<sub>2</sub>O of bore hole 1

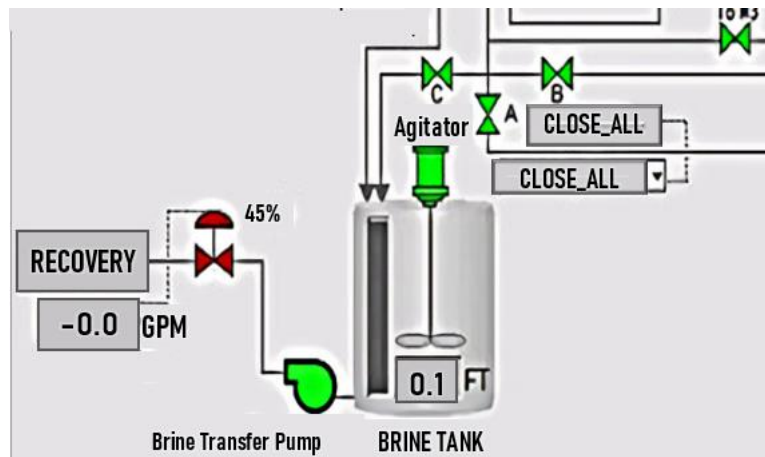


Possible answers		Answer
a)	29.04 mH <sub>2</sub> O	
b)	39.9 mH <sub>2</sub> O	
c)	47.1 mH <sub>2</sub> O	
d)	53.5 mH <sub>2</sub> O	

**Question 39**

Refer to the extract from a SCADA display.

Which ONE of the following figures is the flowrate from the brine tank to the Recovery?



**Possible answers**

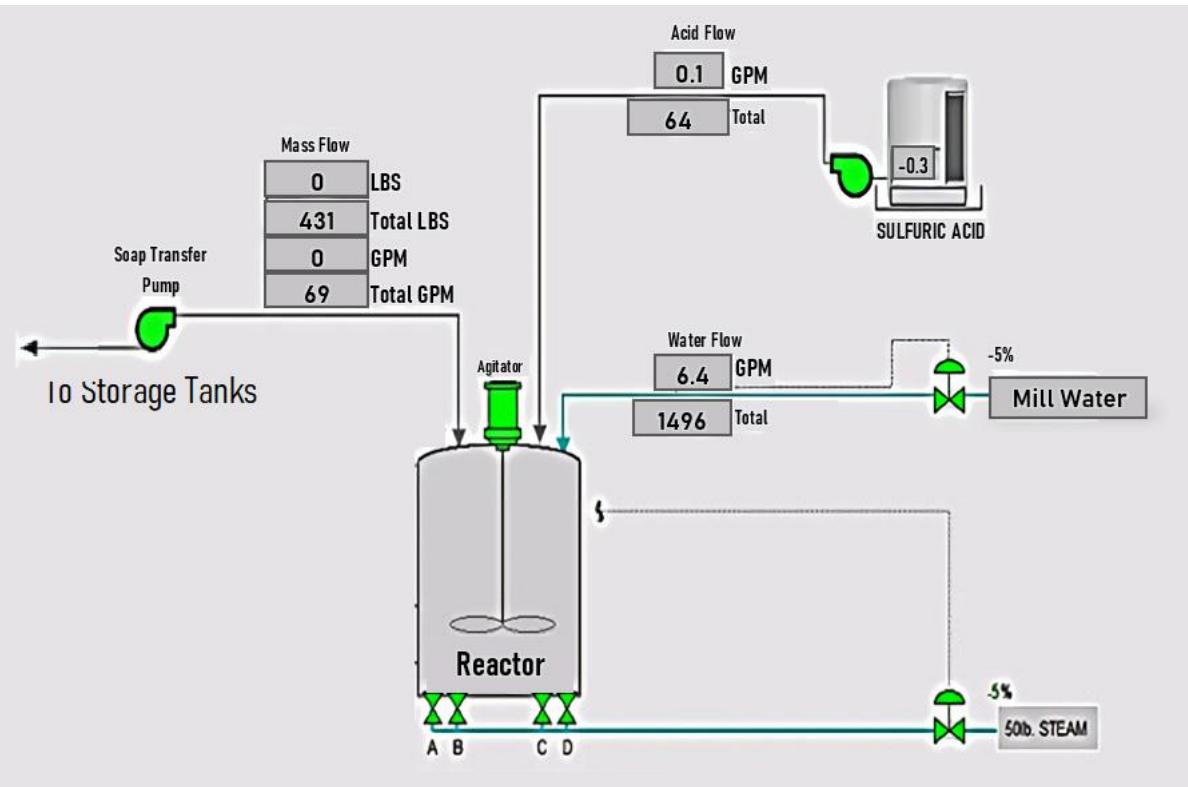
**Answer**

	Possible answers	Answer
a)	-0.0 Gallons Per Minute	
b)	The information is not in the display	
c)	0.1 FT	
d)	45%	

**Question 40**

Refer to the extract from a SCADA display. There is no flow rate being measured from the mill tank to the reactor.

What could prevent the water flow reaching the reactor?



Possible answers		Answer
a)	High levels in the storage tank	
b)	Open pneumatic valve	
c)	Blockage from the West Storage	
d)	Closed pneumatic valve	

**End of Practice Knowledge Assessment**

## Practice Knowledge Assessment

### Answer scheme

Question	Answer	Question	Answer	Question	Answer
1	D	15	B	29	B
2	C	16	D	30	B
3	B	17	C	31	D
4	C	18	D	32	D
5	B	19	B	33	B
6	D	20	B	34	B
7	A	21	C	35	A
8	D	22	C	36	B
9	B	23	C	37	D
10	A	24	A	38	D
11	D	25	C	39	A
12	B	26	A	40	D
13	A	27	A		
14	D	28	C		