

## Utilities Engineering Technician – Instrumentation, Control and Automation

### Practice Knowledge Assessment

Forename (s)	
Surname (s)	
Date	

#### Instructions

- Use black or blue ink or black ball-point pen
- Fill in the boxes at the top of this page
- There are 20 question in this paper
- Mark your answer with an  - if you wish to change your answer please put a line through  and re-select with another
- Only one answer per question allowed

#### Sample:

London is the capital of...

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

## 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 fail and referred to your employer


You may use this page to write on, but it must not be removed.

Do not turn over the page until the invigilator instructs you to.

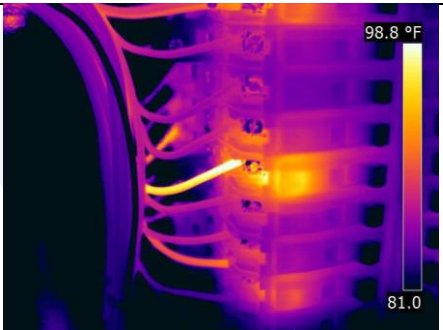
Question 1		
How should <b>electrical isolation</b> be applied?		
Possible answers		Answer
a)	Use the emergency stop	
b)	Follow company electrical isolation and lock off procedures	
c)	Ask someone to isolate it for you	
d)	Switch off the local isolator	

Question 2		
The purpose of a <b>risk assessment</b> is to:		
Possible answers		Answer
a)	identify potential hazards	
b)	make the task safe	
c)	record any isolations	
d)	make sure everyone knows the task	

Question 3		
The <b>procedure</b> used to inform <b>all work party members</b> of planned activity is carried out via:		
Possible answers		Answer
a)	Risk Assessment	
b)	Isolation	
c)	Tool Box Talk	
d)	Site Safety Audit	

Question 4		
What does the <b>blue sign</b> signify?		
Possible answers	Answer	
a) Warning		
b) Prohibition		
c) Information		
d) Mandatory		

Question 5		
Which <b>ONE</b> is the correct interpretation of <b>ohms law</b> ?		
Possible answers	Answer	
a) $I = R \times V$		
b) $I = R \div V$		
c) $I = V \div R$		
d) $I = V \times R$		

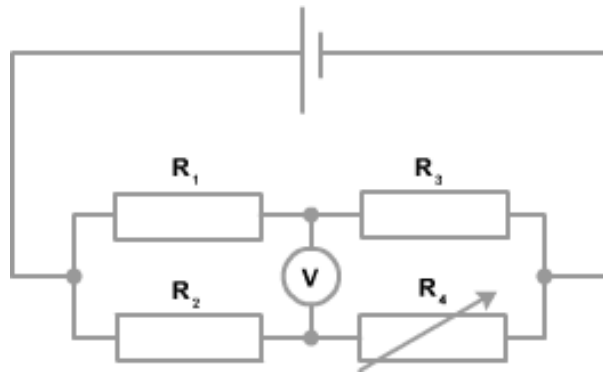
Question 6		
What is the most likely <b>cause</b> of the <b>high temperature</b> on this electrical terminal as seen through a <b>thermal image camera</b> ?		
Possible answers	Answer	
a) Loose terminal		
b) Over voltage		
c) Over current		
d) Terminal too tight		

### Question 7

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)	$450\Omega$	
b)	$500\Omega$	
c)	$200\Omega$	
d)	$250\Omega$	

### Question 8

What **resistance reading** would you expect across a serviceable PT100 RTD at zero degrees centigrade?


#### Possible answers

#### Answer

a)	$1000\Omega$	
b)	$0\Omega$	
c)	$100\Omega$	
d)	$10\Omega$	

Question 9		
What do the different " <b>types</b> " of thermocouples represent i.e. K-Type?		
Possible answers		Answer
a)	Hazardous area applications	
b)	Working Range	
c)	Response times	
d)	Tolerances	

Question 10		
What does the <b>green sign</b> signify?		
Possible answers		Answer
a)	Prohibition	
b)	Warning	
c)	Mandatory	
d)	Information	



Question 11		
Proportional band of the controller is commonly expressed as....		
Possible answers		Answer
a)	gain	
b)	ratio	
c)	range of variables	
d)	percentage	

Question 12		
<b>Complete the sentence:</b>		
_____ uses the concept of limiting the amount of energy at the Hazardous Area so that it is incapable of ignition.		
Possible answers		Answer
a)	Physical isolation	
b)	Intrinsic safety	
c)	Inhibit and override	
d)	Manual isolation	

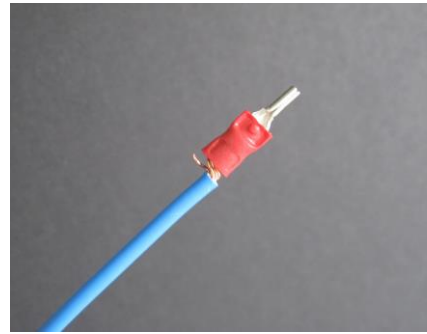
Question 13		
What is an " <b>As Built</b> " drawing?		
Possible answers		Answer
a)	Design drawing	
b)	Construction drawing	
c)	Original drawing	
d)	Updated revision of the original drawing	

Question 14		
What does <b>UEL</b> stand for when referring to <b>hazardous gasses</b> ?		
Possible answers		Answer
a)	Upper exposure limit	
b)	Upper explosive limit	
c)	Under explosive limit	
d)	Under exposure limit	

**Question 15**

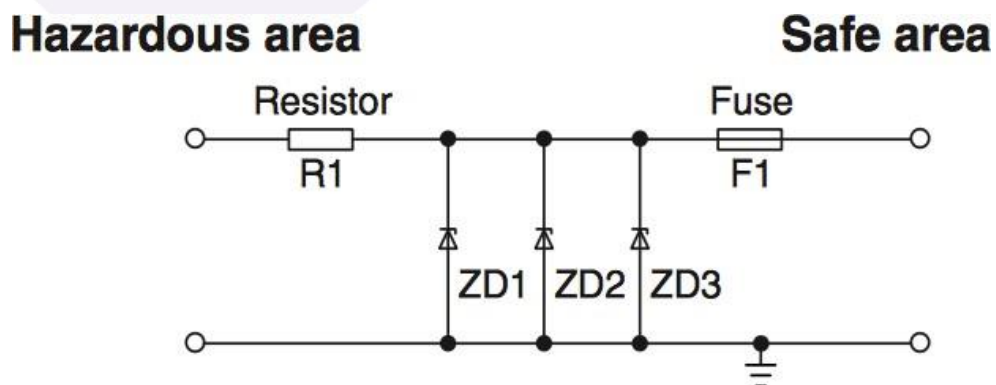
When inspecting wiring terminals, you noticed this crimped connection. What is wrong with it?

Possible answers		Answer
a)	Crimp too small for size wire	
b)	Too much exposed wire at entry point	
c)	Damage crimp	
d)	Loose connection	



**Question 16**

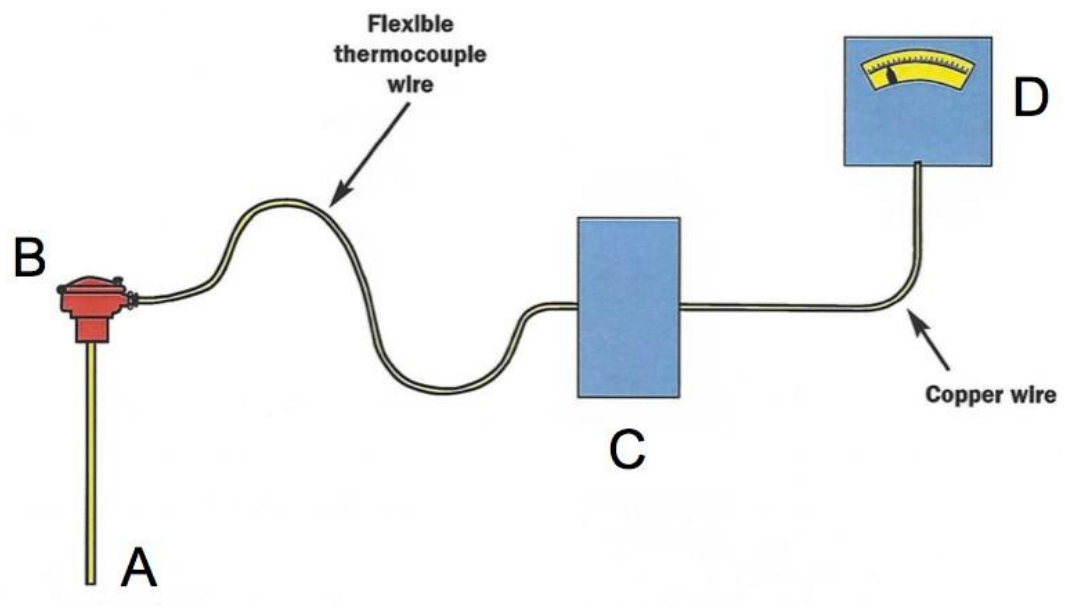
What **device** is this circuit diagram representative of?



Possible answers		Answer
a)	Circuit Breaker	
b)	Thyristor	
c)	PNP Transistor	
d)	Zener Barrier	



Question 17		
The <b>SI</b> unit for temperature, on the practical scale is:		
Possible answers		Answer
a)	Degree Celsius	
b)	Joule	
c)	Pascal	
d)	Kelvin	

Question 18		
Where is the <b>hot junction</b> of this <b>thermocouple loop</b> ?		
		
Possible answers		Answer
a)	A	
b)	B	
c)	C	
d)	D	

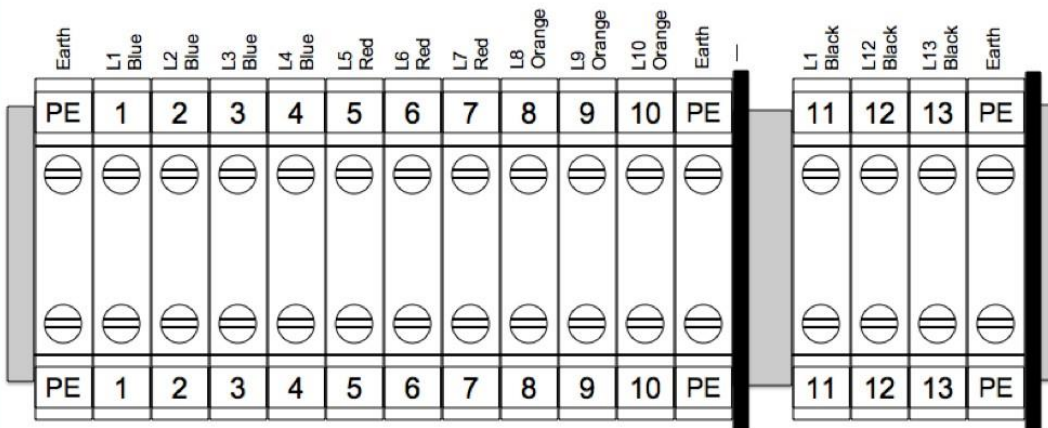
<b>Question 19</b>		
The words which summaries the <b>three methods</b> by which heat is transferred are ...		
<b>Possible answers</b>		<b>Answer</b>
a)	Conduction, Radiation and Resistance	
b)	Condensation, Convection and Radiation	
c)	Resistance, Radiation and Convection	
d)	Conduction, Convection and Radiation	

Question 20 continues on the next page.....

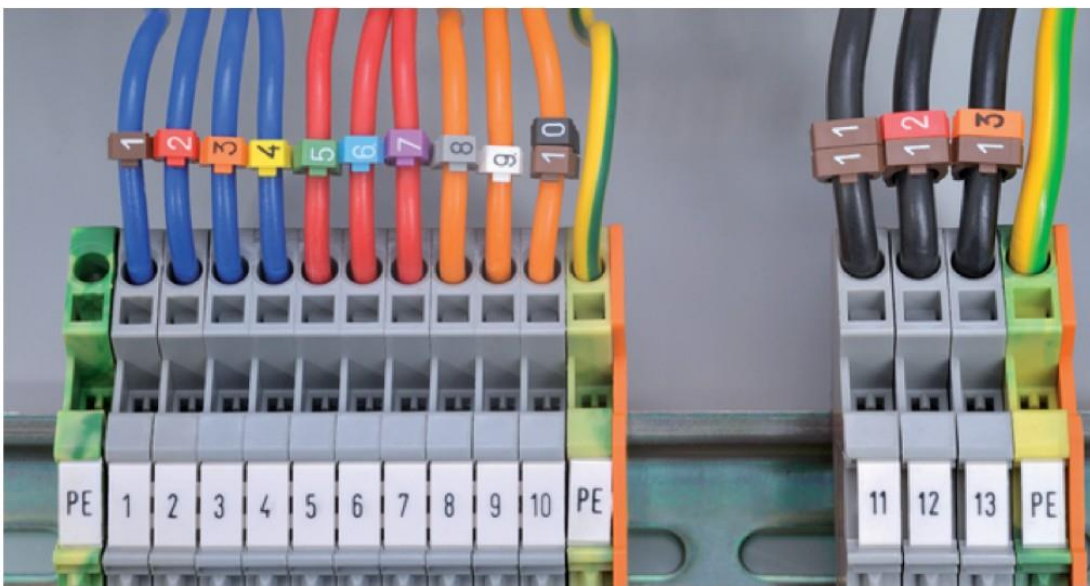


**Question 20**

Where is the **hot junction** of this **thermocouple loop**?



Termination Drawing rev 1.0



**Possible answers**

**Answer**

a)	Wires appear to be crossed	
b)	Missing earth wire	
c)	Terminal rail is incorrectly identified	
d)	Wires are too big	

End of Practice Knowledge Assessment  
Practice Knowledge Assessment

Answer scheme

<b>Question</b>	<b>Answer</b>	<b>Question</b>	<b>Answer</b>
<b>1</b>	A	<b>11</b>	D
<b>2</b>	A	<b>12</b>	B
<b>3</b>	C	<b>13</b>	D
<b>4</b>	D	<b>14</b>	B
<b>5</b>	C	<b>15</b>	A
<b>6</b>	A	<b>16</b>	D
<b>7</b>	A	<b>17</b>	A
<b>8</b>	C	<b>18</b>	A
<b>9</b>	B	<b>19</b>	D
<b>10</b>	D	<b>20</b>	B