SPARKS

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Practice multiple-choice questions for Health & Safety:

(Covering Unit 301 'Understand Health & Safety legislation, practices and procedures…' (Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91 or EAL equivalent)

The following revision questions will help prepare you for the on-line multiple-choice assessment for this Unit.

No 1	When can a Health & Safety Executive Inspector visit a construction site?	**Answer**
a	When an appointment has been made	
b	At any time	X
c	When accompanied by the main contractor	
d	When it is most convenient	

No 2	In what circumstances can an Inspector issue an Improvement Notice?	**Answer**
a	Only during working hours	
b	When a police officer is present	
c	If there is a breach of legal requirements	X
d	If there has been a fatality	

No 3	The responsibility for signing the Company Safety Policy is?	**Answer**
a	The Site Manager	
b	Managing director	X
c	Company Safety Representative	
d	The Local HSE Inspector	

No 4	A prohibition sign	Answer
a	Shows what must not be done	X
b	Indicates what must be done	
c	Warns of danger	
d	Provides general information	

No 5	The letters HSC is the abbreviation for	Answer
a	Health & Safety Consultant	
b	Health & Safety Conditions	
c	Health & Safety Commission	X
d	Health & Safety Corporation	

No 6	A Hazard is	Answer
a	An accident is not likely to happen	
b	Chances are that something is going to go wrong	
c	A condition with the potential to cause harm	X
d	A barrier placed to prevent an accident	

No 7	The colours used on a Mandatory sign are?	Answer
a	Green and white	

b	Blue and white	X
c	Red and white	
d	Yellow and white	

No 8	A company with more than five employees must have a written Health & Safety Policy, this is because?	**Answer**
a	The HSAWA 1974 requires a policy to be written	X
b	The Employment Act requires it	
c	Unions demand it	
d	The Main Contractor must always have a policy	

No 9	The Health and Safety At Work Act 1974 is classed as	**Answer**
a	Government documents	
b	Statements of Intent	
c	Advisory documents	
d	Mandatory legislation	X

No10	How can you help ensure accident do not happen?	**Answer**
a	Report any accident	
b	Understand what you need to do when an accident happens	
c	Know where the First Aid box is located	
d	Report any unsafe conditions	X

An ideal score is 10 out of 10, however if you have scored less than 5 you need to revise your health and safety knowledge before attempting the formal assessment.

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Overcurrent Protection:

(Covering Outcome 2 & 3 of Unit 304 (Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91 or EAL equivalent)

In the following tasks you will need access to the BS7671:2008, IET Wiring Regulations, 'Requirements for Electrical Installations' 17th Edition.

Semi – enclosed fuses to BS3036:

1) The current required to blow a BS3036, 30A rated semi-enclosed fuse in 1 second is?

Answer: 140A (Figure 3A2 (a))

2) The semi-enclosed fuse operates on which specific effect of electric current?

Answer: The heating effect.

3) The material used in a semi-enclosed fuse element is?

Answer: Tinned copper wire.

4) A 45A rated BS3036 semi-enclosed fuse protects a circuit in which a fault current of 100A develops. How long will it take, in seconds, for the fuse to operate?

Answer: 600 seconds (Figure 3A2 (b))

5) Identify two types of overcurrent that may occur in a circuit.

Answer: (i) Overload and (ii) Short – circuit

6) For each of the following supply systems state in which conductor a fuse or circuit-breaker is located:

i) 3 phase and neutral (TP&N)

ii) 1 phase and neutral (SP&N)

iii) 2 – wire direct current

Answer:

i) Each line of the supply. (L1, L2 and L3)

ii) The line conductor

iii) The positive (+) conductor, although sometimes both (+) and (-)

7) State two reasons semi-enclosed fuses to BS3036 are generally not recommended.

Answer:

i) The fuse element oxidises over time and therefore becomes unreliable

ii) The fusing factor is higher than other devices.

Other reasons could be stated such as operating time is greater than other devices.

And the rating factor of 0.725 is to be used when calculating cable sizes protected by this type of device.

8) Define the terms ‘Overload’ and ‘Short-circuit’

Answer:

Overload – A current exceeding full load or rated current of a circuit that is electrically sound.

Short-circuit – A fault of negligible impedance occurring between live conductors having a difference of potential, in a circuit.

9) State the meaning of the following symbols found in relation to protective devices and circuit design: (In), (Iz) and (I_2)

Answer:

(In) – The current rating or setting of a protective device

(Iz) – The current carrying capacity of a cable for continued service

(I_2) – The current causing effective operation of the protective device

10) Determine the current required to effectively operate each of the following BS3036 semi-enclosed fuse in 0.4 seconds.

i) 100A

ii) 60A

iii) 5A

Answer:

i) 1200A (Figure 3A2 (b))

ii) 550A (Figure 3A2 (a))

iii) 24A (Figure 3A2 (a))

Circuit Protection: Practice multiple-choice questions.

(Covering Outcome 2 & 3 of Unit 304 (Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91 or EAL equivalent)

No 1	A semi-enclosed fuse operates on which one of the following principles	**Answer**
a	Magnetic effect of an electric current	
b	Inductive effect of an electric current	
c	Expansion of a fine metal element	
d	Heating effect of an electric current	X

No 2	One disadvantage of a plug-top cartridge fuse is that	**Answer**
a	The fuse element cannot oxidise	
b	It can be easily replaced	
c	Information about the fuse can be printed on it	
d	Incorrectly rated fuses could be fitted	X

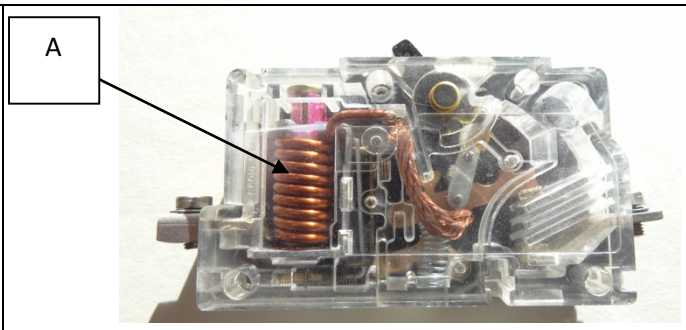
No 3	Which of the following circuit protective devices provides the highest short-circuit breaking capacity?	**Answer**
a	BS88-2 HRC / HBC fuse	X
b	BS88-3 cartridge fuse	
c	BS1362 cartridge fuse	
d	BS3036 semi-enclosed fuse	

No 4	Type B, C and D all refer to which of the following types of protective device?	Answer
a	Semi-enclosed fuses	
b	High rupturing capacity fuses	
c	Circuit - breakers	X
d	Cartridge fuses	

No 5	Circuit-breakers generally can protect against which fault conditions?	Answer
a	Short-circuit only	
b	Overload only	
c	Earth faults of low impedance	
d	Overload ,short-circuit and earth faults of low impedance	X

No 6	A residual current circuit-breaker, (RCD), will protect a circuit against which one of the following conditions?	Answer
a	Earth leakage faults	X
b	Overload faults	
c	Short-circuit faults	
d	Sustained overcurrent	

No 7	The most appropriate type of circuit protective device to be used on a circuit supplying a large electric motor is a?	Answer
a	BS3036 semi-enclosed fuse	
b	Type D circuit-breaker	X
c	Type B circuit-breaker	
d	BS88-3 cartridge fuse	

No 8	 The part of the circuit-breaker indicated by arrow A operates on which one of the following principles?	Answer
a	Thermal effect of electric current	
b	Magnetic effect of electric current	X
c	Temperature sensing	
d	Mechanical leverage	

No 9	An RCBO provides?	Answer
a	Short-circuit protection	
b	Overload protection	
c	Earth leakage protection	
d	All of the above forms of protection	X

No 10	The kA rating of a protective device indicates	Answer
a	Short-circuit rating of the device	X
b	Overload setting of the device	
c	Maximum circuit design current	
d	Minimum current required to operate the device	

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WORDSEARCH

The following words are related to circuit protective devices, their characteristics and design.

Element	Prospective	Carrier	Time
Cartridge	Overload	Holder	Rupturing
Fuse	Thermal	Silver	Trip
Overcurrent	Protection	Tinned	Characteristic
Disconnection	Magnetic	Rating	Operating

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A	B	C	O	N	T	F	C	T	E	L	E	M	E	N	T	F	M	T	H
G	A	R	O	F	H	U	G	N	I	M	M	I	W	S	T	I	O	H	P
E	E	S	P	R	O	S	P	E	C	T	I	V	E	H	B	R	E	E	L
C	K	U	E	P	V	E	P	K	N	F	C	E	L	O	O	E	P	R	F
H	E	I	R	L	E	Q	A	C	O	T	H	H	E	W	O	F	R	M	O
A	L	J	A	U	R	C	T	I	O	N	A	L	A	E	A	I	O	A	U
R	M	M	T	G	L	M	C	A	R	R	I	E	R	N	D	G	T	L	N
A	A	R	I	K	O	M	A	O	L	I	I	M	F	N	M	H	E	W	T
C	G	G	N	U	A	G	R	E	Y	I	R	D	B	L	E	T	C	G	A
T	N	N	G	R	D	H	T	A	V	I	A	N	U	E	W	E	T	A	Y
E	E	S	T	Y	A	E	R	K	A	R	L	U	L	L	O	T	I	T	N
R	T	I	M	E	L	D	I	S	C	O	N	N	E	C	T	I	O	N	J
I	I	L	R	B	E	D	D	E	Z	D	F	A	E	V	C	M	N	S	N
S	C	V	C	A	H	T	G	D	X	D	J	T	R	L	I	E	E	W	J
T	Z	E	U	U	O	V	E	R	C	U	R	R	E	N	T	P	H	I	I
I	Y	R	S	O	L	A	B	R	N	E	A	A	C	K	R	P	W	T	O
C	I	A	T	T	D	A	N	S	P	O	T	E	A	B	I	E	S	C	Q
M	T	I	N	N	E	D	D	A	F	P	I	F	N	M	P	A	T	H	N
I	H	C	E	F	R	U	P	T	U	R	I	N	G	D	E	N	C	Y	X
P	S	F	T	E	S	V	Y	Q	S	E	G	V	J	U	Y	K	L	E	S

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Hand tools:

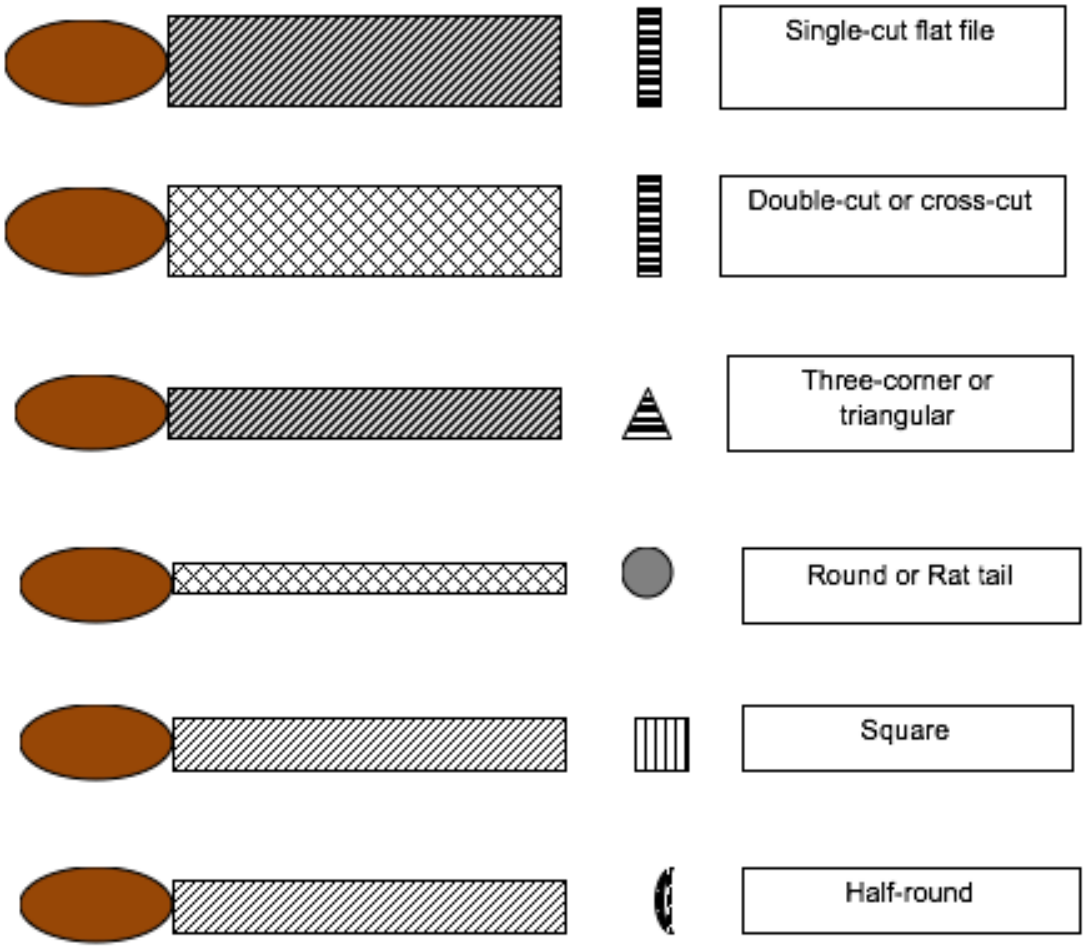
(Covering Outcome 5 sub-section 3 of Unit 305 'Understand the practices and procedures for the preparation and installation of wiring systems and electro-technical equipment in buildings, structures and the environment' (Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91)

Apart from the generally accepted hand-tools such and pliers, screwdrivers and stripping knife, etc… an electrician will also need a hammer, hacksaw, engineers square, marker and a range of files.

The following tasks refer to files, the various types available and the care needed to ensure they last you a long time.

Files:

Task 1: Identify each of the following files

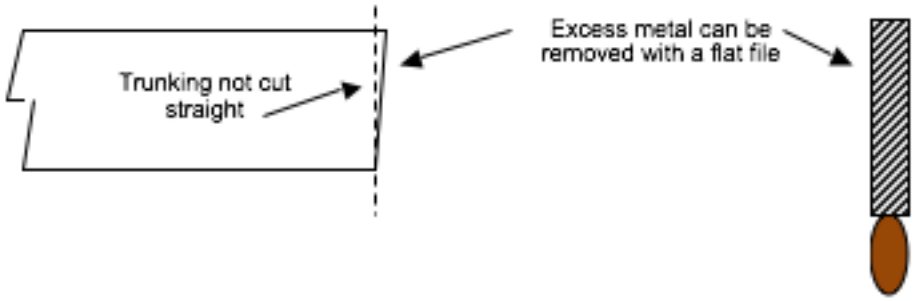


Task 2: Describe the purpose of a file.

Answer:

A file is used to remove excess metal using a physical action. This can include the removal of burrs from cut ends of conduit, trunking, cable tray and ladder rack.

If for example the cut edge of a section of steel trunking is uneven a flat file can be used to remove unwanted metal and thereby make the edge level or straight.



Task 3: Identify **three** different surface finishes of flat files

Answer:

1) Rough; these files have very course teeth that are cut across each other and are designed to remove large quantities of material.

2) Second cut files have teeth cut one way only and are designed to cut equal layers of material with the result the finish is generally smoother than that of the rough cut file.

3) A smooth file will have shallow cut teeth compared to the other files mentioned above, the resulting cut is a smooth fine finish to the work-piece

Task 4: Give two reasons why a file could be damaged

Answer:

1) Files are made from high carbon steel that is heat treated and becomes very hard and brittle, and can easily be broken if handled incorrectly. Excessive pressure, twisting or levering the file is likely to result in it snapping.

2) If a file is in contact with another hardened surface the teeth will be damaged. This can occur if files are stored together in a tool-box.

Task 5: Sometimes the teeth of a file become clogged with metal particles, (swarf); explain how a file can be cleaned and any precautions that must be taken

Answer:

To clean out the swarf a tool called a **file – card** may be used. Alternatively, a stiff wire brush can be just as effective.

NOTE:

Always wear eye protection when performing this task as small metal particles can fly-up.

Task 6: Suggest <u>three</u> safety observations that should be adopted when using hand - files

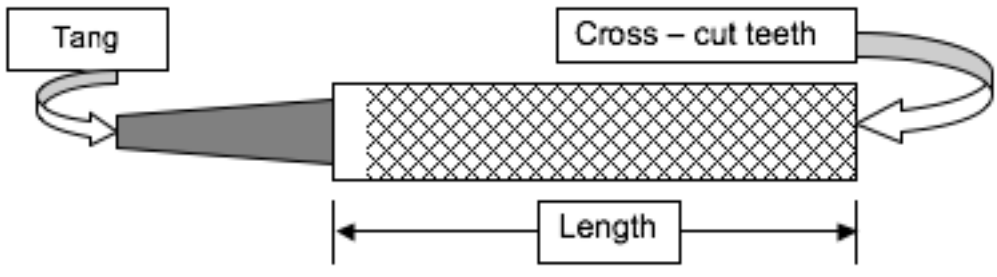
Answer:

1) Never us a file without a handle, if the file jambs on the forward stroke the sharp pointed end, called the' tang' is liable to push into your wrist.

2) If a handle comes off it is best to fit a new one, if this is not possible then try to reuse the old handle but follow the same procedure as fitting a new one,

3) Never use a broken or blunt file

Task 7: Label the following diagram of a flat file



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Steel containment systems:

(Covering Outcome 4 of Unit 304 'Understand the types, applications and limitations of wiring systems and associated equipment' (Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91 or EAL equivalent)

The following questions concern cable tray and basket.

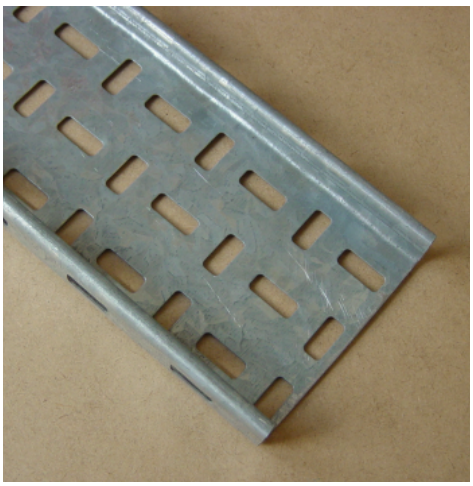
1) Identify **ten** tools that may be required when installing metal cable tray.

Answer:

1) Hacksaw with suitable blade + spare
2) Angle-grinder and safety glasses and gloves
3) Flat file for de-burring cut ends
4) Tape measure and marker (pencil of scriber)
5) Set square
6) G - Clamps
7) Spanners
8) Screwdrivers
9) Spirit level or other levelling device
10) Drilling machine + range of twist drills

2) The image shows a section of cable tray, look at the image and state:

a) The surface finish used in the manufacture, and (b) the type of tray, *(consider the flanges)*



Answer:

a) Surface finish is galvanised

b) The flanges are turned thereby reinforcing the sides of the tray – so this type is heavy duty.

3) Give **three** ways in which cable tray can be supported within a given environment.

Answer:

1) Suspended by steel cables from the ceiling or building structure
2) Clips or set-screws and spacers off a steel frame or similar structure
3) On brackets fixed to the structure of the building

4) When installing long straight lengths of steel cable tray through the roof space of a building, what is the main precaution to be taken regarding the installation of the tray?

Answer:

To provide sufficient supports and to allow for expansion in high temperatures

5) The image shows a section of galvanised steel cable basket. What are the advantages for using basket compared with tray?

Answer:

- Installation time can be quicker
- Product is lighter weight than equivalent size in cable tray
- Basket provides an unlimited number of cable drop-outs making it suitable for data centre installations and similar locations where multiple runs of cable are installed
- Support methods are generally easier to install.



6) For each of the following installation requirements suggest the most suitable cable support method that could be specified:

i) Several large three-phase power cables to be installed between a switch-room and stand-by generators

ii) Twenty radial power circuits originating at a distribution panel and supplying equipment at regular intervals through the length of a factory

iii) A supermarket with twelve point-of-sales check-outs requires power and data cables to be transferred from each point-of-sales to a distribution and data storage location.

Answer:

i) Cable ladder because of its strength and support capabilities

ii) Cable tray because it will be able to support this number of cables plus the cable tray width can be reduced at stages where the number of cables being carried are fewer.

iii) Cable basket because of the need to support numerous data circuits. Power and data can be installed on the basket at opposite sides of the cable support surface thereby reducing the possibility of interference caused by electro-magnetic fields.

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WORDSEARCH

The following words are related to wiring systems, their characteristics and design.

Containment	Steel	Copper	Magnesium
Basket	Sheath	Shroud	Cleat
Trunking	Armour	Olive	Saddle
Conduit	Gland	Neoprene	Bracket
Tray	Locknut	Stub –cap	Galvanised

A	B	C	O	N	T	F	C	T	E	B	E	C	E	N	T	F	B	T	H
G	A	N	O	F	H	U	G	N	I	A	M	L	W	G	T	I	R	H	P
E	E	N	P	R	O	S	P	E	C	S	T	E	E	L	V	R	A	G	L
C	K	E	E	P	V	E	P	K	N	K	C	A	L	A	O	E	C	R	F
H	C	O	P	P	E	R	A	C	O	E	H	T	E	N	O	F	K	M	O
A	L	P	A	U	R	S	H	E	A	T	H	L	A	D	A	I	E	A	U
R	M	R	T	G	O	M	C	A	R	A	I	E	R	N	D	G	T	L	N
A	A	E	I	K	L	M	A	O	L	R	I	M	F	N	M	H	E	W	T
C	O	N	T	A	I	N	M	E	N	T	X	D	B	L	E	T	C	G	A
O	N	E	R	R	V	H	T	A	V	R	A	N	L	E	W	E	T	A	Y
N	E	S	U	Y	E	E	R	K	A	A	R	M	O	U	R	N	I	T	N
D	T	I	N	E	L	D	I	S	C	Y	N	N	C	C	T	I	O	N	J
U	I	L	K	B	E	D	D	E	Z	D	F	A	K	V	C	M	N	S	N
I	C	V	I	A	H	T	G	D	X	D	J	T	N	L	I	S	E	W	J
T	Z	E	N	U	O	V	E	R	C	U	S	T	U	B	C	A	P	I	I
I	M	A	G	N	E	S	I	U	M	E	H	A	T	K	R	D	W	T	O
C	I	A	A	T	D	A	N	S	P	O	R	E	A	B	I	D	S	C	Q
M	T	I	W	N	E	D	D	A	F	P	O	F	N	M	P	L	T	H	N
I	H	C	E	F	R	U	P	T	U	R	U	N	G	D	E	E	C	Y	X
P	S	G	A	L	V	A	N	I	S	E	D	V	J	U	Y	K	L	E	S

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Lighting: (Covering Outcome 10 'Understand the Principles and Applications of Electric Lighting Systems ' (Unit 309 NVQ Level 3 Diploma 2357 – 13 and EAL QELTK3 / 08, and Unit 8 from the '7345').

Discharge Lighting:

The following set of questions concern discharge lighting. It may be necessary to research answers using the internet or with your tutor.

1) When referring to certain discharge lamps what is meant by the letters MCF?

Answer: ***Mercury Coated Fluorescent***, and refers to the tubular low vapour pressure mercury coated fluorescent lamps used for general office, small shop applications.

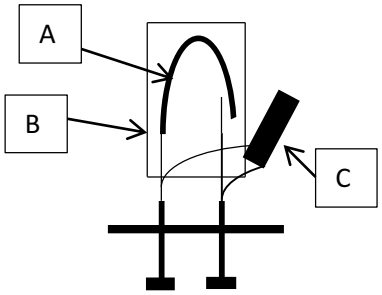
2) For each of the following components found in a MCF single-tube luminaire, state how each is connected in the luminaire circuit.

i) Tube
ii) Choke or ballast
iii) Glow-type starter
iv) Power-factor, (p.f.) capacitor

Answer:

i) In series with the choke, glow type starter and parallel with the single-phase mains supply.
ii) In series with the tube
iii) In series with each end of the tube
iv) In parallel with the mains supply at the luminaire terminals

3) Identify each of the labels shown in the diagram and state the name of this component found in MCF circuits.



Answer:

A Bimetallic strip
B Glass tube
C Capacitor

Generally known as a **'Glow-type' starter**

4) A five year old fluorescent tube flashes on and off and fails to start when the supply is switched on. The luminaire has a glow-type starter and the tube has noticeable blackening at each end. Which component is most likely to need replacement?

Answer: The tube will require replacement.
The blackened ends are an indication that the electron emitting coating on the cathodes or heaters, at each end of the tube has reached the end of its useful life. In some designs the heater is a tungsten filament inside a metal ring that is coated with emissive material; in this case the tungsten filament has oxidised and is unable to reach sufficient temperature to cause electron emissions from the cathode.

5) A circuit contains **five** twin-tube 40W fluorescent MCF luminaires. If the power factor of the circuit is not less than 0.85 lagging and control gear losses are accounted for, determine the full load current for this circuit if the mains supply is 230V single-phase.

Answer:

Total power = 2 x 40 x 5 = **400W**

The total current for this circuit is found by applying the multiplier (1.8) as stated in the IET On-Site Guide for BS7671: 2008 +A3 2015 Appendix A Table A1 footnote.

So **Total power = 400 x 1.8 = 720W**

Therefore total current, It = Power ÷ Volts
= 720 ÷ 230
It = 3.13A

Alternatively the current can be found from Power ÷ Voltage and the answer multiplied by 1.8

6) Briefly explain how light is produced from a low pressure mercury vapour lamp.

Answer:
When the tube is fully struck, i.e. a steady current is flowing through the tube ultra-violet light is produced from free electrons striking the mercury vapour inside the tube. A combination of phosphors is used to thinly coat the inside of the tube. The constant bombardment of the phosphor by electrons colliding with mercury vapour atoms causes the phosphor to 'glow' and produce visible light.

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Lighting: (Covering Outcome 4 of Unit 304 'Understand the types, applications and limitations of wiring systems and associated equipment'. Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91 and EAL unit QELTK3 / 08, and Unit 8 from the '7345').

Try these multiple – choice questions related to the science of light and lighting

No 1	The intensity of a light source such as a tungsten lamp is measured in which one of the following SI units?	**Answer**
a	Lumens	
b	Luminance	
c	Candle power	
d	Candela	X

No 2	The level of light measured at any point on a surface is indicated by which one of the following SI units?	**Answer**
a	Lumen	
b	Candela	
c	Lux	X
d	Flux	

No 3	A polar curve or diagram represents?	**Answer**

a	The way artificial light is distributed from a luminaire	X
b	The way light is reflected from a surface	
c	The shape of the reflector for a given luminaire	
d	The shape of the lamp used in a luminaire	

No 4	The mathematical method used to calculate the light level at a specific point on a surface is called?	**Answer**
a	The Lumen method	
b	Point-to-Point method	X
c	Luminous flux method	
d	Illumination method	

No 5	One example of a lamp that operates on the principle of ‘incandescence’ is the	**Answer**
a	Low pressure mercury vapour discharge lamp	
b	High pressure mercury vapour discharge lamp	
c	Light – emitting – diode lamp	
d	Tungsten filament GLS lamp	X

No 6	A dichroic reflector is most likely to be found in which one of the following types of lamp?	**Answer**
a	Tungsten halogen	X

b	High pressure mercury	
c	High pressure sodium	
d	Low pressure mercury	

No 7	The abbreviations SON and SOX are associated with which types of lamp?	**Answer**
a	Mercury	
b	LED	
c	Sodium	X
d	Tungsten	

No 8	A light source is rated at 6000cd and is situated 4m directly above a horizontal plane, what is the expected level of illumination at a point directly beneath the lamp on the surface?	**Answer**
a	0.267 Lux	
b	375 Lux	X
c	3750 Lux	
d	24000 Lux	

No 9	A power factor correction capacitor is normally incorporated with a light source using?	**Answer**
a	Tungsten filament lamps	

b	Tungsten halogen lamps	
c	Incandescent lamps	
d	Discharge lamps	X

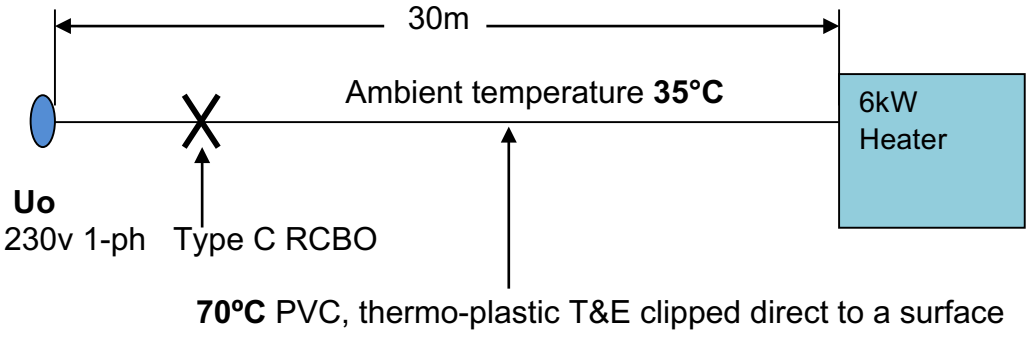
No 10	The characteristic colour of light produced from a SOX lamp is?	**Answer**
a	Blue – green	
b	White	
c	Golden yellow	
d	Orange	X

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Electrical supply systems:
(Covering Outcome 3 of Unit 304 'Understand the Principles for Selecting Cables and Circuit Protection Devices. Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91 and EAL unit 04A, from the '1605', and the Unit 04 from the L3 Electrotechnical Qualification '7345').

Cable selection: You will need access to BS 7671:2008 + A3 2015, for this exercise.

Final circuit requirements:



Ib	26A
In	32A

← Calculated or referenced

← Chosen from Figure 3A5 Appendix 3

	Factor
Ca	0.94
Cg	N/A
Ci	N/A
Cf	N/A

Table Reference (BS7671)
4B1

Cable installation reference method	C

Total rating factor:

C = **Ca** ~~x Cg x Ci x Cf~~
Only Ca applies

Current Carrying Capacity of cable required: **(It)**

$$\mathbf{It} = \frac{\mathbf{In}}{\mathbf{C}} \quad It = \frac{32}{0.94} = \mathbf{34A}$$

Cable size

Table No.	4D5
Column	6
Current rating	37A
Cable size	**4.0mm²**

Voltage drop

Table No:	4D5
Column	8
Voltage drop	**11 mV/A/m**

Actual Voltage drop (AVD) = $\frac{mV/A/M \times Ib \times \text{Length of circuit (L)}}{1000}$

= $\frac{11 \times 26 \times 30}{1000}$ = **8.58 V** (Cable is okay 5% allowed or 11.5V)

Electric Cables – Science and Principles:

(Covering Outcome 4 of Unit 309 'Understand the Relationship Between Resistance, Resistivity, Voltage, Current and Power'. Level 3 NVQ Diploma in Installing Electro-Technical Systems and Equipment 2357-13 / 91 and EAL unit 08, from the '1605', and the L3 Electrotechnical Qualification '7345').

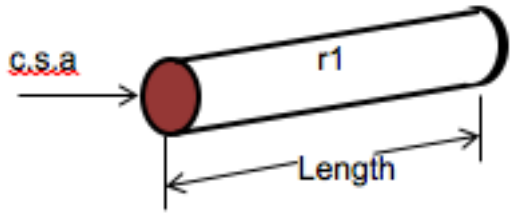
Resistivity:

Electric cables consist of the insulation and the conductor. The conductor is usually made from copper, but can be aluminium where larger cross-sectional-areas may be required.

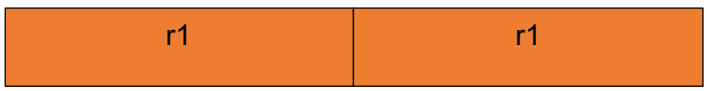
Two facts apply to a conductor:

i) The longer the conductor the greater the resistance.
ii) The greater the c.s.a. the lower the resistance.

This can be shown in a simple diagram:

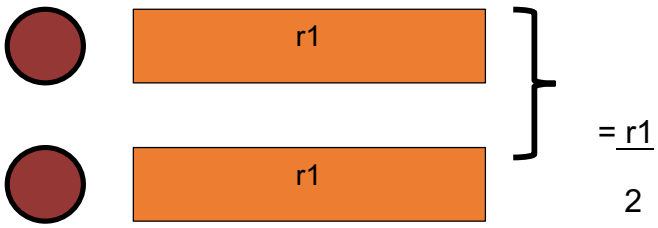


If conductor length is doubled, the conductor resistance is doubled:



R total (Rt) = r1 x 2

If the c.s.a is doubled then the resistance will be halved



End view side view

Worked example:

Let (r1 = 1Ω)

If the conductor is ***doubled*** in length then Rtotal (Rt) = 2 x 1 = **2Ω**

If the conductor length is increased ***five times*** then Rt = 5 x 1 = **5Ω**

Try this:

The resistance of 1m of conductor is 0.025Ω. What is the conductor resistance if the cable is 50m long?

Rt = 0.025 x 50

Now consider the cross-sectional-area, (c.s.a):

Let (r1 = 1Ω)

If the c.s.a is ***doubled*** in size then: Rt = 1 = **0.5Ω** Remember resistance decreases

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If the c.s.a is increased ***six times*** then: Rt = $\frac{1}{6}$ = **0.1667Ω**

Try this:

If a conductor has a resistance of 17.8μΩ / mm, determine the resistance of 10m of this conductor if the c.s.a. is 1.5mm^2

Answer:

By using the resistivity formula it is possible to calculate the resistance of the conductor in one move:

$$\mathbf{Rt = \frac{\rho \times L}{a}}$$

$$Rt = \frac{17.8 \times 10^{-6} \times 10 \times 10^{3}}{}$$