



UEENEEG063 (SIN S7317) – Arrange circuits, control and protection for general electrical installations

Student Name:					
Assessment Date:		ASSESSMENT	1	ATTEMPT	1
<p>STUDENT DECLARATION</p> <p>I certify that I understand the assessment instructions (see page over) and the submitted work is my own.</p> <p>Signed: _____</p>					

Assessment Notes

Time allowed: As advised
Aids Permitted: AS/NZS 3000:2018
AS/NZS 3760:2010

DUE DATE

Assessor Feedback	
Performance demonstrated by this assessment is:	Satisfactory (S) or Not Yet Satisfactory (NYS)
<p>Assessor Comment: _____ The student's result was: _____</p> <p><input type="checkbox"/> Review all the worksheets and/or exercises. <input type="checkbox"/> Attend evening tutorials. <input type="checkbox"/> Join a study group. <input type="checkbox"/> Apply for a retest before the end of your enrolment period. <input type="checkbox"/> Other:</p> <p>Notes:</p> <ol style="list-style-type: none"> 1. You are allowed two assessment attempts in the enrolment period. 2. Failure to achieve a Satisfactory Result within the enrolment period will require re-enrolment. 3. You have the right to appeal your assessment result. 	
Assessor Name:	Assessor Signature:
Date assessment outcome and feedback received on:	Student Signature:

1.	Electric shock can be fatal when the value of current passing through the body exceeds?	
	A	10A
	B	0.01A
	C	0.5A
	D	0.2A
2.	How can the risk of injury from unexpected mechanical movement of electrically actuated equipment be minimised?	
	A	By leaving the area
	B	Use RCD's
	C	Provide electrical or mechanical interlocks
	D	Make sure the MEN system is installed correctly
3.	Protection against the risk of ignition of flammable material due to the thermal effects of current in normal service can be minimised by?	
	A	Providing adequate ventilation
	B	Selecting and installing equipment with suitable temperature characteristics
	C	Minimising the potential for arcing
	D	All of the above
4.	Under what condition may a person come into "indirect contact" with live parts? State the AS/NZS 3000 Clause Number.	
5.	Name two methods, which shall be provided for the protection against "indirect contact" with live parts. State the AS/NZS 3000 Clause Number.	
	a	
	b	

6.	Protection against indirect contact by automatic disconnection of supply in the event of a fault between a live part and an exposed conductive part shall be achieved by?		
	A	Disconnection of the fault by a protective device	
	B	The use of a circuit breaker	
	C	A system of equipotential bonding	
D	All of the above		
7.	The terms Touch current and Touch voltage are only used in connection with?		1
	A	Fault Protection	
	B	Maximum demand	
	C	Earthing systems	
D	Electric fences		
8.	The current path when a short circuit fault to exposed conductive parts of an appliance occurs, is known as?		
	A	continuity	
	B	polarity	
	C	Earth fault loop	
D	Residual current		
9.	Protection against indirect contact can be achieved by?		
	A	The use of class II equipment	
	B	The use of RCD's	
	C	The use of extra-low voltage	
D	All of the above		
10.	Electrical equipment used in damp situations shall be selected and installed to?		
	A	Operate safely in a damp environment	
	B	Provide enhanced protection against electric shock in a damp environment	
	C	Provide protection against water damage	
D	All of the above		
11.	Protection against direct contact can be achieved by?		
	A	Insulation	
	B	Barriers or enclosures	
	C	The use of extra-low voltage	
D	Any/All of the above		

<p>12.</p>	<p>Circuits are logically divided into several categories. The six typical circuits groups are;</p>	
<p>a</p>		
<p>b</p>		
<p>c</p>		
<p>d</p>		
<p>e</p>		
<p>f</p>		
<p>13.</p>	<p>When determining the number and type of circuits required for in an installation, you need to consider</p>	
<p>A</p>	<p>The required current carrying capacity</p>	
<p>B</p>	<p>The overcurrent requirements</p>	
<p>C</p>	<p>The voltage drop requirements</p>	
<p>D</p>	<p>The automatic disconnection of supply requirements</p>	
<p>E</p>	<p>All of the above</p>	
<p>14.</p>	<div data-bbox="287 1030 1260 1747"> <p> HV/LV supply transformer by— a) distributor where external to premises; or b) either distributor or customer within premises Supply to main switchboard by— a) distributor's network; or b) service line; or c) consumer mains Main switchboard Submains Distribution switchboard Safety services circuits (fire, evacuation and lifts) General power, lighting etc. Distribution switchboard (mechanical services) Submains Distribution switchboard Final subcircuits to pumps, chillers etc. Final subcircuits to general lighting, power and etc. </p> </div> <p>Above is an example of the typical circuit arrangement of an electrical installation (to three levels). State four advantages of this arrangement.</p>	
<p>a</p>		
<p>b</p>		
<p>c</p>		
<p>d</p>		

15.	Basic protection of PELV circuits shall be provided by;		
	A	Current limiting	
	B	Barriers and insulation	
	C	The use of VDR's	
	D	All of the above	
16.	Live parts of SELV circuits shall not be connected to earth or protective earth conductors.		
	TRUE/FALSE		
17.	Define <i>Isolation (Isolation function)</i> .		
18.	In accordance with AS/NZS 3000, an electrical installation shall be designed to;		
	a		
	b		
	c		
	d		
	e		
19.	The network operator advises the prospective short circuit current (PSC) at the point of supply of a 415V 3 phase installation is 10,000A. If the impedance of the consumers mains is 0.028Ω per phase what is the PSC at the main switch board? Show all working.		
20.	According to AS/NZS 3000 a fault current is defined as?		

26.	Briefly explain the operating principles of a residual current device. State the AS/NZS 3000 Clause Number.		
27.	A particular final sub-circuit is protected by a 16A Type-C circuit breaker. With reference to the tripping characteristic curve provided, determine the minimum time it would take for the circuit breaker to trip, if a fault current of 32A flowed in the circuit. (Show all working)		
28.	A particular final sub-circuit is protected by a 32M50 motor-rated HRC fuse. With reference to the time/current characteristic curve provided, determine how much time it would take for the fuse to interrupt the supply if a fault current of 100A flowed in the circuit.		
29.	When subjected to a low level overload a thermal/magnetic circuit breaker will utilise what part of its mechanism to trip?		
	A	The bimetal strip	
	B	The solenoid	
	C	The yoke	
	D	The thermistor	
30.	'A deliberately created weak link in the circuit which open circuits due to the melting of the element by excessive current.' Describes the operating principle of;		
	A	A Main switch	
	B	An RCD	
	C	A Fuse	
	D	A Circuit Breaker	
31.	According to AS/NZS 3760 when testing 30mA RCD using special test equipment what is the maximum allowable tripping time?		
	A	30mS ± 8mS	
	B	300mS ± 8mS	
	C	300mS ± 0.8mS	

	D	3mS ± 80mS	
32.	What table in AS/NZS 3000 gives the maximum values of earth fault loop impedance for a given protective device rating?		
33.	Name two possible effects of overvoltage on an electrical system.		
34.	Name a device which can be used to protect against the effects of overvoltage.		
	A	PTC	
	B	VDR	
	C	LDR	
	D	NTC	
35.	What is one possible effect of under voltage in an electrical system?		
36.	How can an electrical installation be protected against the effects of under voltage?		
	A	Set the voltage slightly higher than required.	
	B	The use of non-latched Magnetic contacts	
	C	The use of Magnetic under voltage relays	
	D	Both B and C	
37.	What is the minimum permissible sized copper main earthing conductor that can be used in an installation, if the active conductor of the consumer's mains is 16mm ² ?		
	A	16mm ²	
	B	6mm ²	
	C	4mm ²	

	D	1.5mm ²	
38.	Name the six parts of an earthing system.		
	a) b) c) d) e) f)		
39.	All sub main and sub circuit protective earthing conductors shall be directly or indirectly connected to the main earthing conductor.		
	TRUE/FALSE		
40.	Define the following terms; (according to the AS/NZS 3000)		
	(a)Earthed (b)Earth Electrode (c)Equipotential Bonding (d)Main Earth (e)Functional Earthing (f)Protective Earthing		
41.	What is the general requirement of AS/NZS 3000 in relation to the accessibility of switch boards? Give the Clause number.		

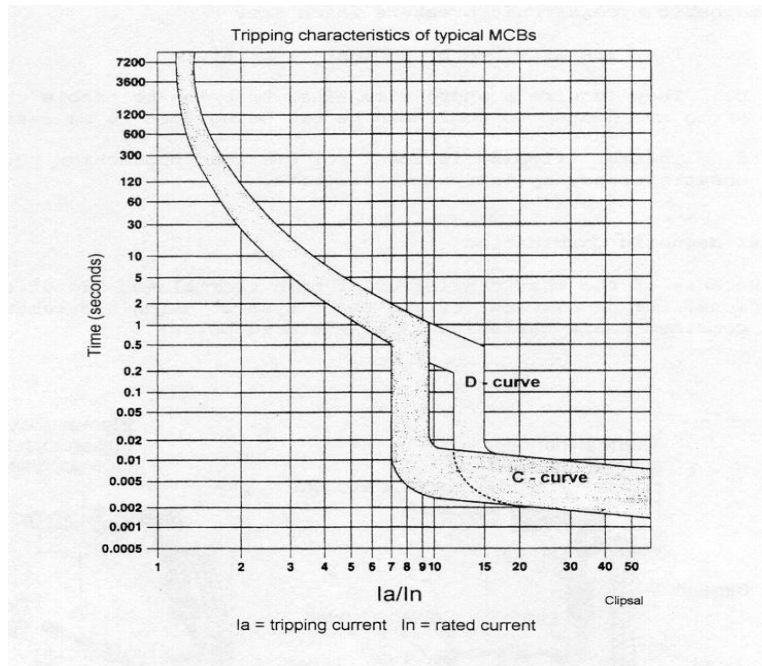
Your Score	Total Marks	%
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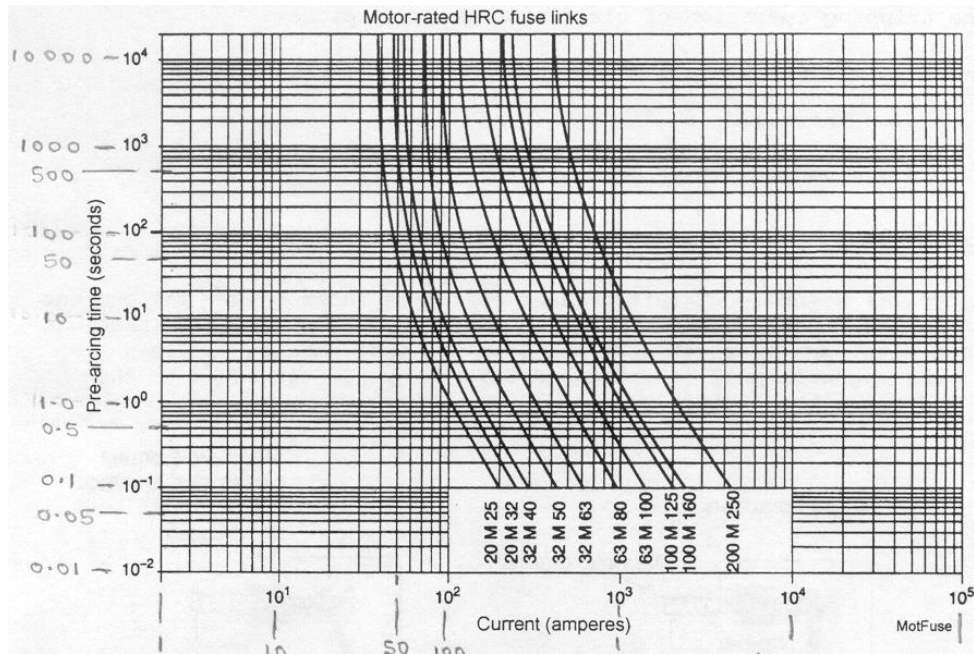
FORMULA

$$Z_s = V / I$$

$$I_{\text{fault}} = E_{\text{phase}} / (Z_1 + Z_2)$$



Typical MCB tripping characteristic curve



Typical Motor-Rated HRC Time/Current Characteristic Curves