

Digital Download Pages

One Minute Drills

Provided by ElectricianEducation.com

David U. Larson
Master Electrician

One Minute Drill #1

One Minute Drill - Class #1

Electrical Symbols

Answer				
	1.	E	a.	amps
	2.	I	b.	impedance
	3.	R	c.	volt amperes
	4.	P	d.	work - watt meter
	5.	Z	e.	inductive reactance
	6.	HP	f.	watts including mechanical efficiency
	7.	VA	g.	electrical efficiency
	8.	W	h.	volts
	9.	XL	i.	horse power
	10.	pf	j.	ohms

NEC Table Numbers

Answer				
	1.	240.6	a.	conductor ampacity
	2.	310.16	b.	equipment grounding
	3.	110.26	c.	circular mils
	4.	Ch9 T8	d.	overhead outdoor conductor ampacity
	5.	300.5	e.	grounding electrode conductor
	6.	250.122	f.	flc three phase motor
	7.	430.248	g.	overcurrent standard sizes
	8.	310.17	h.	flc one phase motor
	9.	250.66	i.	cover requirements
	10.	430.250	j.	working clearance

One Minute Drill - Class #2

Conduit Fill Tables Annex C

Answer				
	1.	C1	a.	ENT
	2.	C2	b.	LFNC
	3.	C3	c.	RMC
	4.	C4	d.	IMC
	5.	C5	e.	RPVC 40
	6.	C7	f.	RPVC 80
	7.	C8	g.	EMT
	8.	C9	h.	PVCEB
	9.	C10	i.	LFMC
	10.	C12	j.	FMC

Locations - Conditions

Answer				
	1.	dust tight	a.	dust will not interfere
	2.	dry location	b.	rain will not interfere
	3.	wet location	c.	moisture will not interfere
	4.	rainproof	d.	not more than 50 feet
	5.	raintight	e.	roofed open porch
	6.	watertight	f.	underground
	7.	weatherproof	g.	building under construction
	8.	dustproof	h.	weather will not interfere
	9.	damp location	i.	dust will not enter
	10.	in sight from	j.	rain will not enter

One Minute Drill #3

NEC Colors

Answer				
	1.	orange	a.	grounding
	2.	white	b.	277v non heating lead
	3.	green	c.	ungrounded
	4.	gray with red and black	d.	neutral
	5.	red	e.	240v non heating lead
	6.	blue	f.	120v non heating lead
	7.	light blue	g.	208v non heating lead
	8.	black	h.	high leg Delta
	9.	brown	i.	vacuum cleaner cord grounded
	10.	yellow	j.	grounded

Motor Aspects

Answer				
	1.	disconnect one motor	a.	125% table flc
	2.	branch circuit one motor	b.	highest rating of any overcurrent protection plus other flc's
	3.	overloads	c.	250% table value flc - go up
	4.	motor overcurrent protection inverse time	d.	140% nameplate flc
	5.	motor overcurrent non renewable fuse	e.	175% table flc - go up
	6.	feeder conductor 4 motors	f.	300% table flc - go up
	7.	motor overcurrent protection dual element	g.	115% table flc
	8.	motor overcurrent protection instantaneous trip	h.	125% table flc largest plus other table flc's
	9.	feeder overcurrent protection	i.	700% table flc - go up
	10.	ultimate trip current	j.	thermal overload protection

One Minute Drill #4

One Minute Drill #4

Article Numbers

Answer				
	1.	motors	a.	100
	2.	680	b.	Ch9 T8
	3.	grounded conductor	c.	ampacity
	4.	90	d.	210
	5.	branch circuits	e.	introduction
	6.	310.16 table	f.	pools
	7.	circular mils	g.	200
	8.	Ch9 T4	h.	raceways
	9.	definitions	i.	430
	10.	300	j.	wiring methods

Measurements - Inches

Answer				
	1.	1/4	a.	thickness of compound in seal off
	2.	1/2	b.	considered outside building under concrete
	3.	5/8	c.	maximum height disconnect handle
	4.	3/4	d.	taper on rigid conduit
	5.	1 1/4	e.	sheath of NM into box
	6.	2	f.	working space L to R at disconnect
	7.	3	g.	minimum box depth with device
	8.	6	h.	conductor away from ballast if not 90 deg C
	9.	30	i.	minimum box depth
	10.	79	j.	free conductor

One Minute Drill #5

Electrical Units

Answer				
	1.	continuity	a.	electrical efficiency
	2.	impedance	b.	watt meter
	3.	amp	c.	electrical pressure
	4.	true power	d.	high resistance measurement
	5.	volt	e.	resistance in AC circuits
	6.	apparent power	f.	work done
	7.	ohm	g.	electrical path
	8.	meg ohm	h.	current flow
	9.	watt	i.	resistance in DC circuits
	10.	pf	j.	includes pf

Chapter 4 Articles Numbers

Answer				
	1.	402	a.	motors
	2.	424	b.	transformers
	3.	404	c.	appliances
	4.	410	d.	heating
	5.	400	e.	flexible cords
	6.	440	f.	refrigeration
	7.	490	g.	fixture wires
	8.	430	h.	fixtures
	9.	422	i.	over 600 volts
	10.	450	j.	switches

One Minute Drill #6

Raceways

Answer				
	1.	EMT	a.	362
	2.	ENT	b.	360
	3.	FMT	c.	358
	4.	IMC	d.	344
	5.	RMC	e.	352
	6.	FMC	f.	353
	7.	RNMC	g.	356
	8.	HPPE PVC EB	h.	342
	9.	LTFMC	i.	350
	10.	LTFNMC	j.	348

Electrical Math Terms

Answer				
	1.	milli	a.	thousand
	2.	K	b.	work done
	3.	Kcmil	c.	thousand volt amperes
	4.	P	d.	thousand watts
	5.	W	e.	unity
	6.	VA	f.	watt meter reading
	7.	KVA	g.	one thousandth
	8.	KV	h.	thousand volts
	9.	KW	i.	includes power factor
	10.	pf=1.0	j.	thousand circular mils

One Minute Drill #7

Article 100 Definitions #1

Answer				
	1.	varying duty	a.	constant load for a short definite time
	2.	continuous load	b.	no entrance of water
	3.	overload	c.	load regularly recurrent
	4.	intermittent duty	d.	load at variation intervals
	5.	raintight	e.	operation in excess of rating
	6.	short time duty	f.	constant load indefinitely long time
	7.	overcurrent	g.	rain will not interfere with operation
	8.	continuous duty	h.	alternate intervals of load no load
	9.	rainproof	i.	current in excess of rating
	10.	periodic duty	j.	three hours or more

Article 100 Definitions #2

Answer				
	1.	labeled	a.	2 or 3 conductors share neutral
	2.	appliance branch circuit	b.	suitable for intended use
	3.	approved	c.	service to last overcurrent device
	4.	general purpose branch circuit	d.	to one utilization equipment
	5.	identified	e.	to 2 or more utilization equipment
	6.	individual branch circuit	f.	last overcurrent device to load
	7.	listed	g.	supplies 2 or more appliances or lights
	8.	multi wire branch circuit	h.	UL seal affixed
	9.	feeder	i.	inspector accepted
	10.	branch circuit	j.	highest quality of electrical material

One Minute Drill #8

Conductors

Answer				
	1.	cm	a.	4110 cm
	2.	Kcmil	b.	10380 cm
	3.	14	c.	3 cu. in. for fill
	4.	12	d.	start to size pull box on raceway size
	5.	10	e.	smallest ground ring conductor
	6.	8	f.	6530 cm
	7.	6	g.	circular mils
	8.	4	h.	smallest that can be paralleled
	9.	2	i.	5 cu. in. for fill
	10.	1/0	j.	thousand circular mils

Amps at 60 Degrees C - Table Reading Practice

Answer				
	1.	6	a.	40
	2.	4	b.	25
	3.	3	c.	110
	4.	14	d.	125
	5.	2	e.	20
	6.	12	f.	70
	7.	1	g.	30
	8.	10	h.	85
	9.	1/0	i.	95
	10.	8	j.	55

One Minute Drill #9

Box Fill Cubic Inches - Calculator Practice

Answer				
	1.	3	14-2-G-NM with 1 sw	a. 26
	2.	4	14-2-G-NM with 2 sw	b. 20.25
	3.	1	12-2-G-NM with 1 sw	c. 34
	4.	1	12-2-G-NM with 1 rec	d. 9
	5.	2	12-2-G-NM with 2 sw	e. 16
	6.	2	12-2-G-NM with 2 rec	f. 20
	7.	2	14-3-g-NM with 2 sw	g. 18
	8.	4	14-2-G-NM with 2 rec	h. 22
	9.	6	14-2-G-NM with 2 sw	i. 12
	10.	6	14-2-G-NM with 2 rec	j. 11.25

Conductor Circular Mils - Table Use

Answer				
	1.	6		a. 6530
	2.	8		b. 52620
	3.	4		c. 4110
	4.	10		d. 83690
	5.	3		e. 10380
	6.	12		f. 105600
	7.	2		g. 41740
	8.	14		h. 26240
	9.	1		i. 66360
	10.	1/0		j. 16510

One Minute Drill #10

Bus Bar Ampacity - Calculator Practice

Answer				
	1.	1/2 x 1/2 copper	a.	175
	2.	1/2 x 1/2 aluminum	b.	525
	3.	1/2 x 3/4 copper	c.	700
	4.	1/2 x 3/4 aluminum	d.	2187.5
	5.	3/4 x 1 copper	e.	262.5
	6.	3/4 x 1 aluminum	f.	1531.25
	7.	1 x 1 copper	g.	750
	8.	1 x 1 aluminum	h.	250
	9.	1 1/4 x 1 3/4 copper	i.	1000
	10.	1 1/4 x 1 3/4 aluminum	j.	375

Transformers - Single Phase

Answer				
	1.	Np	a.	voltage line
	2.	Ns	b.	watts input
	3.	Pp	c.	current primary
	4.	Ps	d.	input : output
	5.	Ep	e.	Ps divided by Pp
	6.	Es	f.	turns load side
	7.	Ip	g.	current secondary
	8.	Is	h.	voltage load side
	9.	ratio	i.	turns primary
	10.	efficiency	j.	watts output