



Errata/addenda: Module 3 deel 2 werkboek bij de tweede druk (2009)

De onderstaande wijzigingen/toevoegingen zijn reeds verwerkt in de derde druk van deze module.

Op het eerste schutblad is een waarschuwing geplaatst dat het boek uitsluitend gebruikt mag worden voor trainingsdoeleinden.

Part-66 tabel is aangepast naar aanleiding van veranderde regelgeving als gevolg van EU verordening No 1149/2011 van 21 oktober 2011.

Blz. 15, vraag 8

Vraag tekstueel aangepast.

Blz. 16, vraag 9

Meer ruimte in afbeelding.

Blz. 19, vraag 6

In afbeelding pijl bij Schakelaar S omgedraaid.

Blz. 22, vraag 8

Woord spoel vervangen door spoelkern.

Blz. 23, vraag 1

In afbeelding A is de stroomrichting omgekeerd.

Blz. 39, vraag 2

In de kop van de tabel 2 x DC-generator vervangen door Startergenerator.

Blz. 40

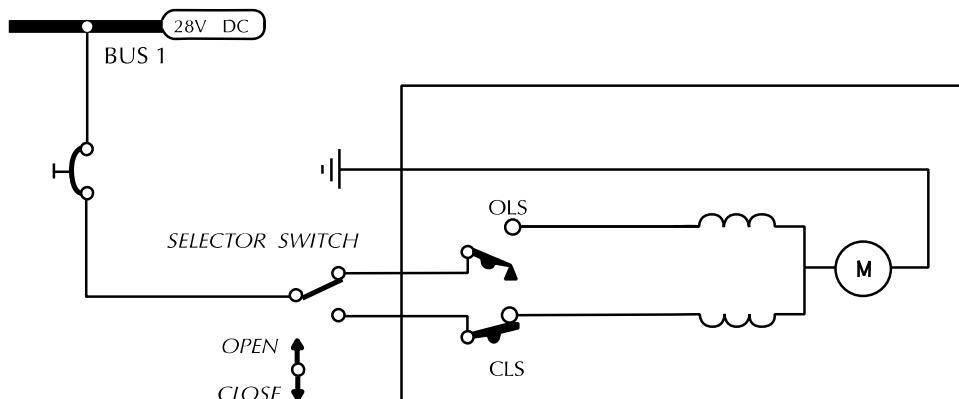
Deze zoekopdracht kan alleen worden uitgevoerd op een bepaalde onderwijslocatie. Deze zoekopdracht verwijderd.

Blz. 51, vraag 3

In afbeelding C is de stroomrichting omgedraaid.

Blz. 52, vraag 9

Aantal boogjes in de afbeelding is aangepast.





Blz. 61, vraag 2

Aan de vraag is “bij een sterschakeling?” toegevoegd.

Blz. 65, vraag 5

Afbeelding aangepast.

In de antwoorden tabel is I vervangen door I_{eff} .

Blz. 84, vraag 3

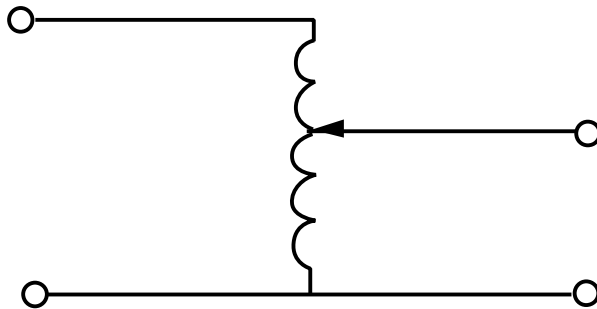
“Wat versta je onder de arbeidsfactor?” vervangen door “Wat is de arbeidsfactor?”

Blz. 101, vraag 6 en 7

Deze vraag is een Multiple choice vraag. A en B voor de mogelijke antwoorden geplaatst.

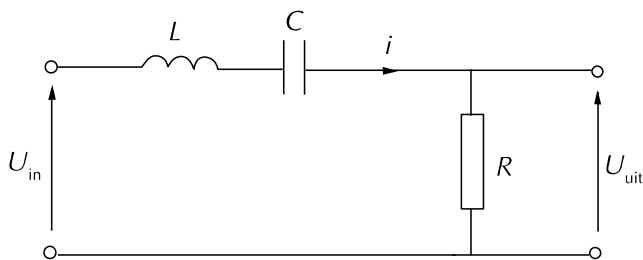
Blz. 105, vraag 7

Pijl punt toegevoegd in de afbeelding.



Blz. 114, vraag 1

Ontbrekende lijn in de afbeelding aangebracht.



Blz. 118, vraag 10

Antwoord C aangepast door banddoorlaatfiter te vervangen door afvlakfilter.

Bijlage: Part 66

Categorie		A level	B1 level	B2 level	B3 level	Deel	Hfst
3.1	Electron Theory Structure and distribution of electrical charges within: atoms, molecules, ions, compounds; Molecular structure of conductors and insulators.	1	1	1	1	1	1
3.2	Static Electricity and Conduction Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases and a vacuum.	1	2	2	1	1	2
3.3	Electrical Terminology The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	1	2	2	1	1	3
3.4	Generation of electricity Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.	1	1	1	1	1	4
3.5	DC Sources of electricity Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells; Cells connected in series and parallel; Internal resistance and its effect on a battery; Construction, materials and operation of thermocouples; Operation of photo-cells.	1	2	2	2	1	5
3.6	DC Circuits Ohms Law, Kirchoff's Voltage and current Law's; Calculations using the above laws to find resistance, voltage and current; Significance of the internal resistance of a supply.	-	2	2	1	1	6
3.7a	Resistance/Resistor Resistance and effecting factors; Specific resistance; Resistor colour code, values and tolerances, preferred values, wattage ratings; Resistors in series and parallel; Calculation of total resistance using series, parallel and series parallel combinations; Operation and use of potentiometers and rheostats; Operation of Wheatstone Bridge.	-	2	2	1	1	7
3.7b	Resistance/Resistor Positive and negative temperature coefficient conductance; Fixed resistors, stability, tolerance and limitations, methods of construction. Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers and rheostats; Construction of Wheatstone Bridge;	-	1	1	-	1	7

Categorie		A level	B1 level	B2 level	B3 level	Deel	Hfst
3.8	<p>Power</p> <p>Power, work and energy (kinetic and potential); Dissipation of power by a resistor; Power formula Calculation involving power, work and energy.</p>	-	2	2	1	1	8
3.9	<p>Capacitance/Capacitor</p> <p>Operation and function of a capacitor; Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; Capacitor types, construction and function; Capacitor colour coding; Calculations of capacitance and voltage in series and parallel circuits; Exponential charge and discharge of a capacitor, time constants; Testing of capacitors.</p>	-	2	2	1	1	9
3.10a	<p>Magnetism</p> <p>Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the earth's magnetic field; Magnetisation and demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction and principles of operation; Hand clasp rules to determine: magnetic field around currentcarrying conductor.</p>	-	2	2	1	1	10
3.10b	<p>Magnetism</p> <p>Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care and storage of magnets.</p>	-	2	2	1	1	10
3.11	<p>Inductance/Inductor</p> <p>Faraday's law; Action of inducing a voltage in a conductor moving in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor terms; Mutual induction; The effect of rate of change of primary current and mutual inductance has on induced voltage; Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coils with respect to each other; Lenz's law and polarity determining rules; Back emf, self induction; Saturation point; Principle uses of inductors;</p>	-	2	2	1	2	1

Categorie		A level	B1 level	B2 level	B3 level	Deel	Hfst
3.12	<p>DC Motor/Generator Theory.</p> <p>Basic motor and generator theory; Construction and purpose of components in DC generator; Operation of, and factors affecting output and direction of current flow in DC generators; Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; Series wound, shunt wound and compound motors; Starter Generator construction.</p>	-	2	2	1	2	2, 3
3.13	<p>AC Theory.</p> <p>Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power; Triangular/Square waves; Single/3 phase principles.</p>	1	2	2	1	1	11
3.14	<p>Resistive (R), Capacitive (C) and Inductive (L) Circuits.</p> <p>Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations.</p>	-	2	2	1	2	5
3.15	<p>Transformers.</p> <p>Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line and phase voltages and currents; Calculation of power in a three phase system; Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers.</p>	-	2	2	1	2	6