

(M03)基礎電學：

題號	答案	題目
1(0020378)	C	What material does not act as good insulator? (A) plastics (B) ceramics (C) carbon fibers 下列何物質不是好之絕緣體? (A) 塑膠 (B) 陶瓷 (C) 碳纖維
2(0020449)	C	What device is used to store electrical energy in an electrostatic field? (A) A battery. (B) A transformer. (C) A capacitor. 甚麼裝置被用來儲存靜電場之電子能量? (A) 電池 (B) 變壓器 (C) 電容器
3(0047295)	B	What is the formula for conductance? (R=Resistance) (A) $R + 1$. (B) $1/R$. (C) $1-R$. 電導的公式是什麼? (R=電阻) (A) $R + 1$ 。 (B) $1/R$ 。 (C) $1-R$ 。
4(0047397)	A	An ammeter is connected into a circuit in (A) series. (B) shunt. (C) parallel. 安培表應該如何與電路連接 (A) 串聯。 (B) 分流。 (C) 並聯。
5(0020278)	C	A circuit with resistor parallel connected can be used as (A) potential divider (B) power divider (C) current divider 並聯電阻電路可用於 (A) 電位分配 (B) 功率分配 (C) 電流分配
6(0047437)	C	Carbon's resistance has a (A) temperature coefficient of zero. (B) positive temperature coefficient. (C) negative temperature coefficient. 碳電阻具有何種特性? (A) 溫度係數為零。 (B) 正溫度係數。 (C) 負溫度係數。
7(0020388)	C	A resistor is marked with the following coloured stripes: blue, grey, orange, silver. What is its value and tolerance? (A) 3.4kohm, $\pm 5\%$ (B) 10kohm, $\pm 10\%$ (C) 68kohm, $\pm 10\%$ 一電阻外殼之顏色為藍色、灰色、橘色、銀色。請問此電阻值及誤差百分比為 (A) 3.4kohm, $\pm 5\%$ (B) 10kohm, $\pm 10\%$ (C) 68kohm,

		±10%
8(0047420)	C	<p>Which of the following will cause the resistance of a conductor to decrease? (A) Decrease the length or the cross-sectional area. (B) Increase the length or decrease the cross-sectional area. (C) Decrease the length or increase the cross-sectional area.</p> <p>下列何者將導致導體的電阻降低? (A) 減小長度或橫截面面積。 (B) 增加長度或減少截面面積。 (C) 減少長度，或增加橫截面的面積。</p>
9(0020473)	C	<p>What is the maximum voltage that may be connected across a 20 watt, 2000 ohm resistor? (A) 10 volts. (B) 100 volts. (C) 200 volts.</p> <p>一個20瓦特，2000歐姆之電阻可接之最大電壓值是多少? (A) 10伏特 (B) 100伏特 (C) 200伏特</p>
10(0047537)	C	<p>The MMF(Magneto-Motive Force) of a coil fed with 2 amps and having 10 turns is (A) 5 ampere turns. (B) 2 amperes turns. (C) 20 ampere turns.</p> <p>一個10匝的線圈通以2安培電流，則其MMF(Magneto-Motive Force)為何? (A) 5安匝數。 (B) 2安匝數。 (C) 20安匝數。</p>
11(0047137)	B	<p>A material that can easily be magnetized has which of the following properties? (A) Residual magnetism. (B) High permeability. (C) Low permeability.</p> <p>是什麼特性使物質容易被磁性化? (A) 殘留的磁性。 (B) 高導磁性。 (C) 低導磁性。</p>
12(0047529)	C	<p>The term used to denote the strength of a magnetic field is (A) retentivity. (B) hysteresis. (C) flux density.</p> <p>用以表示磁場強度的專有名詞是 (A) 頑磁強度。 (B) 滯後現象。 (C) 磁通密度。</p>
13(0047515)	A	<p>Which pair of the following materials would most readily become magnetized? (A) Iron and steel. (B) Copper and steel. (C) Nickel and bronze.</p> <p>下列那一對材料最容易被磁化? (A) 鐵和鋼。 (B) 銅和鋼。 (C) 鎳和銅。</p>
14(0020308)	B	<p>Ferromagnetic materials can be demagnetized (A) within a band of temperatures (B) above a certain temperature (C) below a certain</p>

		<p>temperature</p> <p>下列何者可使鐵磁材料被去磁? (A) 在某種之溫度之範圍 (B) 超過某一溫度 (C) 低於某一溫度</p>
15(0047211)	B	<p>The unit which consists of two or more different types of atoms is known as a (A) particle of an element. (B) molecule of a compound. (C) molecule of an element.</p> <p>具有兩種以上的原子所組成的物質單位稱為? (A) 元素的粒子。 (B) 化合物的分子。 (C) 元素的分子。</p>
16(0047190)	C	<p>When a 3A current flows through a 3-ohm resistor, what is the power dissipated by the resistor? (A) 1watt (B) 9watt (C) 27watt</p> <p>當3安培之電流流過一個3歐姆之電阻，試問該電阻所消耗之功率為何? (A) 1瓦特 (B) 9瓦特 (C) 27瓦特</p>
17(0047434)	C	<p>An increase in operating temperature in most electrical devices carrying current results in (A) a decrease in resistance and an increase in current. (B) no effect on the resistance and current. (C) an increase in resistance and a decrease in current.</p> <p>在大多數載流電路裝置中，增加工作溫度會導致 (A) 電阻減少且電流增大。 (B) 對電阻和電流都沒影響。 (C) 電阻增加且電流減少。</p>
18(0020276)	C	<p>The power rating of a resistor is (A) the minimum power that the resistor can safely dissipate (B) the minimum voltage that the resistor can safely generate (C) the maximum power that the resistor can safely dissipate</p> <p>電阻器之額定功率(power rating)為 (A) 電阻器可安全消耗之最低功率 (B) 電阻器可安全產生之最低電壓 (C) 電阻器可安全消耗之最高功率</p>
19(0047412)	C	<p>In general, increasing the cross sectional area of an electrical cable (A) increases its resistance. (B) enables it to carry more voltage. (C) enables it to carry more current.</p> <p>在一般情況下，電纜的橫截面面積的增加將會? (A) 增加電阻。 (B) 使其能夠承受更多的電壓。 (C) 使其能夠承受更多的電流。</p>
20(0047409)	C	<p>In a parallel resistor circuit of R1 and R2, the total resistance is (A) $R_T = 1/R_1 + 1/R_2$. (B) $1/R_T = (R_1 \times R_2) \div (R_1 + R_2)$. (C) $1/R_T = 1/R_1 +$</p>

		<p>1/R2.</p> <p>電阻R1及R2並聯的電路中，R1與R2的總電阻為 (A) $R_T = 1/R_1 + 1/R_2$ 。 (B) $1/R_T = (R_1 \times R_2) \div (R_1 + R_2)$ 。 (C) $1/R_T = 1/R_1 + 1/R_2$ 。</p>
21(0020399)	A	<p>An ideal capacitor acts as a(n) ... circuit to a DC Current source. (A) open (B) short (C) semi-open</p> <p>一理想電容對直流電流源來說是一個...</p> <p>(A) ...開路 (B) ...短路 (C) ...半開路</p>
22(0020452)	C	<p>What determines the strength of the magnetic field around a conductor? (A) The resistance divided by the current. (B) The ratio of the current to the resistance. (C) The amount of current.</p> <p>環繞在導體之電磁場強度是由甚麼決定？ (A) 導體電阻除於電流量 (B) 電流量電阻之比值 (C) 電流量</p>
23(0047534)	C	<p>A material with a narrow hysteresis loop (A) cannot be magnetised. (B) will have high retentivity. (C) will have low retentivity.</p> <p>窄小磁滯迴路的材料 (A) 不能被磁化。 (B) 會有高的保磁性。 (C) 會有低的保磁性。</p>
24(0047511)	A	<p>A solenoid of 10 turns per metre carries a current of 5A. If the current is reduced to 2.5A, how many turns would be required to maintain the same magnetic field? (A) 20. (B) 50. (C) 5.</p> <p>每米10匝的電螺管載有5A的電流。若電流減為2.5A，則每米須多少匝以維持相同的磁場？ (A) 20。 (B) 50。 (C) 5。</p>
25(0020328)	B	<p>To find which end of an electromagnet is the north pole, use the (A) Fleming's Left Hand Rule (B) Right Hand Clasp Rule (C) Cork Screw Rule</p> <p>使用下列何者可找出磁北端？ (A) Fleming之左手定則(Fleming's Left Hand Rule) (B) 右手扣定則(Right Hand Clasp Rule) (C) 科克螺旋定則(Cork Screw Rule)</p>
26(0047112)	B	<p>According to the circuit, what is the equivalent resistance between points C and D? (A) 32Ω(B) 36Ω (C) 40Ω</p> <p>依據電路圖，試問C、D兩點間之等效電阻為何？ (A) 32Ω(B) 36Ω (C) 40Ω</p>

27(0047438)	B	<p>The 5th coloured band on a resistor represents the (A) reliability or temperature coefficient. (B) tolerance. (C) multiplier.</p> <p>電阻器上的第5條色帶代表 (A) 可靠性或溫度係數。 (B) 誤差值。 (C) 乘數。</p>
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28(0047415)	A	<p>The formula for resistance in series is... (A) $R_T = R_1 + R_2 + R_3 \dots R_n$. (B) $R_T = R_1 \times R_2 \times R_3 \dots R_n$. (C) $1/R_T = 1/(R_1 \times R_2 \times R_3 \dots R_n)$.</p> <p>串聯電阻的公式為? (A) $R_T = R_1 + R_2 + R_3 \dots R_n$。 (B) $R_T = R_1 * R_2 * R_3 \dots R_n$。 (C) $1/R_T = 1/(R_1 \times R_2 \times R_3 \dots R_n)$。</p>
29(0020172)	B	<p>What is the total resistance when resistor color code is brown, black, red and golden. (A) 2k ohms, tolerance+/- 5% (B) 1k ohms, tolerance+/- 5% (C) 1k ohms, tolerance+/- 10%</p> <p>有一電阻其色環之顏色為棕、黑、紅、金，其電阻值為多少？ (A) 2k ohms, 誤差+/- 5% (B) 1k ohms, 誤差+/- 5% (C) 1k ohms, 誤差+/- 10%</p>
30(0020505)	A	<p>While the equipment is in operation the variable resistors are used to vary the resistance. Which statement is truth? (A) wire-wound variable resistors control large currents (B) carbon variable resistors control large current (C) wire-wound variable resistor control carbon resistors</p> <p>當裝備在操作時，可變電阻器之變換會使電阻值改變。下列敘述何者正確? (A) 繞線式可變電阻器可以控制大量電流 (B) 碳堆可變電阻器可以控制大量電流 (C) 繞線式可變電阻器可以控制碳堆電阻器</p>

31(0020360)	C	The S.I. unit of magnetic flux density is the (A) Weber (B) Henry (C) Tesla 磁通密度之單位為何？ (A) 韋伯(Weber) (B) 亨利(Henry) (C) 特斯拉(Tesla)
32(0020420)	C	Which of the following appliances has direct relationship with eddy current? (A) an electric rice cooker (B) a thermal cooker (C) an induction cooker 下列電器用品中，何者之工作原理和渦電流(eddy current)有直接之關係？ (A) 電鍋 (B) 悶燒鍋 (C) 電磁爐
33(0047540)	A	Permeability of a material can be found by (A) flux density / MMF. (B) MMF \times flux density. (C) MMF / flux density. 如何計算一材料的導磁率？ (A) 磁通密度 / MMF。 (B) MMF \times 磁通密度。 (C) MMF / 磁通密度。
34(0020290)	C	A ferromagnetic material (A) is a permanent magnet (B) is a magnetic force insulator (C) can exhibit magnetic properties when subject to the influence of a magnet 何謂強磁性物質 (ferromagnetic material) (A) 就是永久性磁鐵 (B) 是磁力遮蔽器 (C) 受到磁鐵影響時可以產生磁性
35(0020359)	B	A soft iron core is used in an ELECTRO magnet because (A) it has HIGH permeability and HIGH coercivity (B) it has HIGH permeability and LOW coercivity (C) it has LOW permeability and HIGH coercivity 一個軟鐵核心是用在電磁鐵，因為 (A) 它具有很高之導磁率和高抗磁力 (B) 具有高導磁率和低抗磁力 (C) 具有低導磁率和高抗磁力
36(0047671)	A	A parallel RLC circuit at resonance has (A) maximum impedance. (B) zero impedance. (C) minimum impedance. 並聯RLC電路在諧振時有 (A) 最大阻抗。 (B) 零阻抗。 (C) 最低阻抗。
37(0047443)	B	A resistor dissipates 80 Watts. If it runs for 4 hours 15 minutes, how much energy is dissipated in total? (A) 20.4KJ. (B) 1.224 MJ. (C) 191.25 J.

		一個電阻，功耗為80瓦。?如果工作4小時15分鐘，有多少能量被消耗？ (A) 20.4 KJ。 (B) 1.224 MJ。 (C) 191.25 J。
38(0020455)	C	<p>What is the meaning of the term time constant of an RC circuit? (A) The time required to charge the capacitor in the circuit to 36.8% of the supply voltage. (B) The time required to charge the capacitor in the circuit to 36.8% of the supply current. (C) The time required to charge the capacitor in the circuit to 63.2% of the supply voltage.</p> <p>電阻-電容電路之時間常數，它之意義為何？ (A) 電路中電容累積充電到電壓源之百分之三十六點八所須要之時間 (B) 電路中電容之累積充電到電流源之百分之三十六點八所須要之時間 (C) 電路中電容累積充電到電壓源之百分之六十三點二所須要之時間</p>
39(0047724)	A	<p>An increase in which of the following factors will cause an increase in the inductive reactance of a circuit? (A) Inductance and frequency. (B) Resistance and capacitive reactance. (C) Resistance and voltage.</p> <p>下列何者的增加會導致電路的電感抗增加？ (A) 電感和頻率。 (B) 電阻和電容電抗。 (C) 電阻和電壓。</p>
40(0020469)	A	<p>Assuming a power source to have a fixed value of internal resistance, maximum power will be transferred to the load when: (A) The load resistance equals the internal resistance of the source. (B) The load resistance is greater than the source resistance. (C) The load resistance is less than the source resistance.</p> <p>假設有一固定內部電阻之電力源，它在甚麼情況下有最大之功率轉換到負載？ (A) 負載電阻相等於電力源之內部電阻 (B) 負載電阻大於電力源之內部電阻 (C) 負載電阻小於電力源之內部電阻</p>
41(0047201)	A	<p>When circuit frequency approaches infinity, an inductor acts like a(n) (A) open circuit. (B) short circuit. (C) semi-conducted circuit.</p> <p>當電路頻率趨近無限大時，電感的導電程度趨近於？ (A) 開路。 (B) 短路。 (C) 半導通。</p>
42(0047125)	C	<p>If $C_1=5F$, $C_2=4F$, $C_4=C_3=2F$, $C_5=3F$ in the following circuit, then how much is the total capacitance? (A) 4.5F. (B) 5.5F. (C) 7F.</p> <p>如圖示電路，若$C_1=5F$、$C_2=4F$、$C_4=C_3=2F$、$C_5=3F$，請問總電容為何？ (A) 4.5F。 (B) 5.5F。 (C) 7F。</p>

43(0020540)	C	<p>Which of the following is passive component? (A) diode (B) transistor (C) resistor</p> <p>下列何種元件為被動元件? (A) 二極體 (B) 電晶體 (C) 電阻</p>
44(0020445)	B	<p>What is the relationships between power factor and phase angle in circuits. (A) $PF=\sin(\theta)$ (B) $PF=\cos(\theta)$ (C) $PF=\tan(\theta)$</p> <p>電路中功率因數與相位角之關係為何? (A) $PF=\sin(\theta)$ (B) $PF=\cos(\theta)$ (C) $PF=\tan(\theta)$</p>
45(0047756)	C	<p>Which of the following would be used to calculate transformer turns ratio? (A) Secondary turns \div primary turns. (B) Primary turns \times secondary turns. (C) Primary turns \div secondary turns.</p> <p>應使用下列何者用來計算變壓器的匝數比例? (A) 次級匝數除以初級匝數。 (B) 初級匝數乘次級匝數。 (C) 初級匝數除以次級匝數。</p>
46(0047738)	C	<p>How to reduce the wasted power dissipation caused by the parasitic resistance in a circuit? (A) In crease the parasitic resistance in circuit. (B) Keep the parasitic resistance in circuit the same. (C) Reduce the parasitic resistance in circuit.</p> <p>如何減少電路中因寄生電阻而浪費掉的功率消耗? (A) 增加電路中的寄生電阻。 (B) 將電路中的寄生電阻保持不變。 (C) 減少電路中的寄生電阻。</p>
47(0047791)	C	<p>A capacitor acts like a short circuit at high frequencies, then the circuit in the picture is a ... (A) band-pass filter. (B) high-pass filter. (C) low-pass filter.</p> <p>電容於高頻時特性趨近於短路，試問下圖中之電路為何種濾波器? (A) 帶通濾波器。 (B) 高通濾波器。 (C) 低通濾波器。</p>

