Buon compito ☺

Liceo Statale "Niccolò Machiavelli" di Roma
5° anno – Verifica di Fisica n. 2 – CLIL Electric Currents

Versione ♡0

Data		Classe	

Alunno	

Il punteggio per ogni risposta corretta è di 4 punti, per ogni risposta omessa 1 punto, per ogni risposta sbagliata 0 punti. La durata della verifica è di un'ora. Si suggerisce di ricopiare le risposte nella tabella a seguire o in caso di difficoltà nella copia se ne segnali l'assenza.

Tabella delle risposte									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

1. When there is an electric current passing through a wire, the particles moving are:

- A electrons.
- B protons.
- C atoms.
- D ions.

(2) The unit of current is:

- [A] ampere.
- [B] watt.
- [C] volt.
- [D] coulomb.

(3) A positive charge released from rest:

- [A] moves towards the regions of lower potential.
- [B] moves towards the regions of higher potential.
- [C] moves towards the regions of equal potential.
- [D] does not move.

(4) The amount of charge flowing through a cross-sectional area of a wire per unit of time is called:

- [A] Current.
- [B] Voltage.
- [C] Power.
- [D] Resistance.

(5) Determine the direction of the conventional current through the light bulb in the circuit presented in Figure 1 at the end of the text.

- [A] To the right.
- [B] To the left.
- [C] Downward.
- [D] Upward.

(6) A battery is used to:

- [A] maintain a potential difference.
- [B] measure electric current.
- [C] measure electric potential.
- [D] safeguard against short-circuit.

7. THE WORK DONE IN MOVING A UNIT POSITIVE CHARGE ACROSS TWO POINTS IN AN ELECTRIC CIRCUIT IS A MEASURE OF:

   A. POTENTIAL DIFFERENCE.
   B. CURRENT.
   C. RESISTANCE.
   D. POWER.

8. JOULE/COULOMB IS SAME AS:

   A. VOLT.
   B. WATT.
   C. AMPERE.
   D. OHM.

9. COMPLETE THE FOLLOWING STATEMENT: "THE ELECTROMOTIVE FORCE IS:

   A. THE MAXIMUM POTENTIAL DIFFERENCE BETWEEN THE TERMINALS OF A BATTERY".
   B. THE FORCE THAT ACCELERATES ELECTRONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".
   C. THE FORCE THAT ACCELERATES PROTONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".
   D. THE MAXIMUM ELECTRIC POTENTIAL ENERGY STORED WITHIN A BATTERY".

10. COMPUTE THE NUMBER OF ELECTRONS FLOWING THROUGH A BATTERY THAT DELIVERS A CURRENT OF 3.0 A FOR 12 S.

   A. 2.2×10^{20}.
   B. 36.
   C. 4.8×10^{15}.
   D. 6.4×10^{18}.

11. A 10 A CURRENT IS MAINTAINED IN A SIMPLE CIRCUIT. COMPUTE THE NET CHARGE THAT PASSES THROUGH ANY POINT IN THE CIRCUIT DURING A 1 MINUTE INTERVAL.

   A. 600 C.
   B. 200 C.
   C. 500 C.
   D. 400 C.

(12) OHM'S LAW RELATES POTENTIAL DIFFERENCE WITH:

- A CURRENT.
- B POWER.
- C ENERGY.
- D TIME.

(13) THE CURRENT IN A WIRE:

- A DEPENDS ON BOTH RESISTANCE AND POTENTIAL DIFFERENCE.
- B DEPENDS ONLY ON THE POTENTIAL DIFFERENCE APPLIED.
- C DEPENDS ONLY ON THE RESISTANCE OF THE WIRE.
- D DOES NOT DEPEND ON RESISTANCE AND POTENTIAL DIFFERENCE.

(14) DETERMINE WHICH OF THE FOLLOWING STATEMENTS DOES NOT REPRESENT OHM'S LAW.

- A CURRENT = RESISTANCE $\times$ POTENTIAL DIFFERENCE.
- B CURRENT / POTENTIAL DIFFERENCE = CONSTANT.
- C POTENTIAL DIFFERENCE / CURRENT = CONSTANT.
- D POTENTIAL DIFFERENCE = CURRENT $\times$ RESISTANCE.

(15) THE POTENTIAL DIFFERENCE REQUIRED TO PASS A CURRENT 0.2 A IN A WIRE OF RESISTANCE $20\ \Omega$ IS:

- A 4 V.
- B 100 V.
- C 1 V.
- D 40 V.

(16) THE RESISTANCE OF AN ELECTRIC BULB DRAWING 1.2 A CURRENT AT 6.0 V IS:

- A 5 W.
- B 0.5 W.
- C 0.2 W.
- D 2 W.

(17) DETERMINE WHICH OF THE GRAPHS IN FIGURE 2 AT THE END OF THE TEXT REPRESENTS OHM'S LAW FOR A SOLID CONDUCTOR.

- A (C).
- B (A).
- C (B).
- D (D).

(18) THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 3. COMPUTE THE RESISTANCE OF THE WIRE.

- A 1.7 Ω.
- B 1 Ω.
- C 0.8 Ω.
- D 0.4 Ω.

(19) THE UNIT OF RESISTIVITY IS:

- A OHM·M.
- B OHM.
- C OHM/M.
- D OHM/M^2.

(20) THE RESISTIVITY OF A WIRE DEPENDS ON:

- A MATERIAL.
- B LENGTH.
- C AREA OF CROSS-SECTION.
- D LENGTH, MATERIAL AND AREA OF CROSS-SECTION.

(21) A WIRE OF LENGTH L AND CROSS-SECTIONAL AREA A HAS A RESISTIVITY ρ. DETERMINE WHICH OF THE FOLLOWING FORMULAS CAN BE USED TO CALCULATE THE RESISTANCE OF THE WIRE.

- A $R = \frac{\rho L}{A}$.
- B $R = \frac{\rho A}{L}$.
- C $R = \frac{L}{\rho A}$.
- D $R = \frac{A}{\rho L}$.

22. ALL OF THE WIRES IN FIGURE 4 AT THE END OF THE TEXT ARE MADE OF THE SAME MATERIAL BUT ARE DIFFERENT SIZES. IDENTIFY THE WIRE WITH THE LOWEST RESISTANCE.

- A (B).
- B (A).
- C (C).
- D (D).

23. TWO COPPER WIRES HAVE THE SAME CROSS-SECTIONAL AREA BUT HAVE DIFFERENT LENGTHS. WIRE X HAS A LENGTH L AND WIRE Y HAS A LENGTH $2L$. THE RATIO BETWEEN THE RESISTANCE OF WIRE Y AND WIRE X IS:

- A $\frac{R_Y}{R_X} = \frac{2}{1}$.
- B $\frac{R_Y}{R_X} = \frac{1}{1}$.
- C $\frac{R_Y}{R_X} = \frac{1}{2}$.
- D $\frac{R_Y}{R_X} = \frac{1}{4}$.

24. TWO ALUMINUM WIRES HAVE THE SAME LENGTH AND DIFFERENT CROSS-SECTIONAL AREA. WIRE B HAS TWICE THE RADIUS OF THAT OF WIRE A. DETERMINE HOW THE RESISTANCE OF WIRE B COMPARES TO THE RESISTANCE OF WIRE A.

- A $\frac{R_B}{R_A} = \frac{1}{4}$.
- B $\frac{R_B}{R_A} = \frac{1}{1}$.
- C $\frac{R_B}{R_A} = \frac{1}{2}$.
- D $\frac{R_B}{R_A} = \frac{2}{1}$.

25. THE UNIT OF ELECTRIC POWER IS:

- A WATT.
- B AMPERE.
- C VOLT.
- D JOULE.

(26) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A CONDUCTOR AND P IS THE VOLTAGE ACROSS THE CONDUCTOR, THE POWER DISSIPATED IS DESCRIBED BY THE FORMULA:

A $D \cdot P$.

B $D^2 \cdot P$.

C $D \cdot P^2$.

D D^2/P.

(27) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A RESISTOR WITH RESISTANCE F, THE POWER DISSIPATED BY THE RESISTOR IS DESCRIBED BY THE FORMULA:

A $D^2 \cdot F$.

B $D \cdot F$.

C $D \cdot F^2$.

D D^2/F.

(28) WHEN A CURRENT I FLOWS THROUGH A RESISTANCE R FOR TIME t THE ELECTRICAL ENERGY SPENT IS GIVEN BY:

A I^2Rt.

B IRt.

C IR^2t.

D I^2R/t.

(29) HEAT PRODUCED IN A CURRENT CARRYING WIRE IN 5S IS 60 J. THE SAME CURRENT IS PASSED THROUGH ANOTHER WIRE OF HALF THE RESISTANCE. THE HEAT PRODUCED IN 5 S WILL BE:

A 30 J.

B 60 J.

C 15 J.

D 120 J.

(30) THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 3. COMPUTE THE POWER DISSIPATED IN THE RESISTOR WHEN THE APPLIED VOLTAGE IS 5 V.

A 15 W.

B 5 W.

C 10 W.

D 20 W.

(31) DETERMINE WHICH ONE OF THE FOLLOWING STATEMENTS CONCERNING RESISTORS IN SERIES IS *true*.

- A THE CURRENT THROUGH EACH RESISTOR IS THE SAME.
- B THE VOLTAGE ACROSS EACH RESISTOR IS THE SAME.
- C THE POWER DISSIPATED BY EACH RESISTOR IS THE SAME.
- D THE TOTAL CURRENT THROUGH THE RESISTORS IS THE SUM OF THE CURRENT THROUGH EACH RESISTOR.

(32) DETERMINE WHICH ONE OF THE FOLLOWING STATEMENTS CONCERNING RESISTORS IN PARALLEL IS *true*.

- A THE VOLTAGE ACROSS EACH RESISTOR IS THE SAME.
- B THE CURRENT THROUGH EACH RESISTOR IS THE SAME.
- C THE POWER DISSIPATED BY EACH RESISTOR IS THE SAME.
- D THE TOTAL VOLTAGE ACROSS THE RESISTORS IS THE SUM OF THE VOLTAGE ACROSS EACH RESISTOR.

(33) TWO RESISTANCES OF 100 Ω AND ZERO OHM ARE CONNECTED IN PARALLEL. THE OVERALL RESISTANCE WILL BE:

- A 0 Ω.
- B 100 Ω.
- C 50 Ω.
- D 25 Ω.

(34) TWO RESISTANCES OF 100 Ω AND ZERO OHM ARE CONNECTED IN SERIES. THE OVERALL RESISTANCE WILL BE:

- A 100 Ω.
- B 50 Ω.
- C 25 Ω.
- D 0 Ω.

(35) THREE RESISTORS 2 Ω , 3 Ω AND 4 Ω ARE CONNECTED SO THAT THE EQUIVALENT RESISTANCE IS 9 Ω. THE RESISTORS ARE CONNECTED:

- A ALL IN SERIES.
- B ALL IN PARALLEL.
- C 2 Ω AND 3 Ω IN PARALLEL AND THE COMBINATION IN SERIES WITH 4 Ω.
- D 2 Ω AND 3 Ω IN SERIES AND THE COMBINATION IN PARALLEL TO 4 Ω.

(36) In Figure 5 at the end of the text,

- [A] 3 Ω , 6 Ω are in parallel and 9 Ω is in series.
- [B] 6 Ω, 3 Ω and 9 Ω are in series.
- [C] 9 Ω and 6 Ω are in parallel and the combination is in series with 3 Ω.
- [D] 3 Ω , 6 Ω and Ω are in parallel.

(37) In Figure 6 at the end of the text, the resistance across AB is:

- [A] 1 Ω.
- [B] 4 Ω.
- [C] 2 Ω.
- [D] 0.5 Ω.

(38) Three equal resistances when combined in series are equivalent to 90 Ω. Their equivalent resistance when combined in parallel will be:

- [A] 10 Ω.
- [B] 270 Ω.
- [C] 30 Ω.
- [D] 810 Ω.

(39) Two resistors $R_1 = 3\ \Omega$ and $R_2 = 6\ \Omega$ are connected in parallel. Compute the net resistance in the circuit.

- [A] 2 Ω.
- [B] 1 Ω.
- [C] 3 Ω.
- [D] 6 Ω.

(40) Two resistors $R_1 = 6\ \Omega$ and $R_2 = 12\ \Omega$ are connected in parallel to each other and in series to $R_2 = 2\ \Omega$. Compute the net resistance in the circuit.

- [A] 6 Ω.
- [B] 1 Ω.
- [C] 3 Ω.
- [D] 2 Ω.

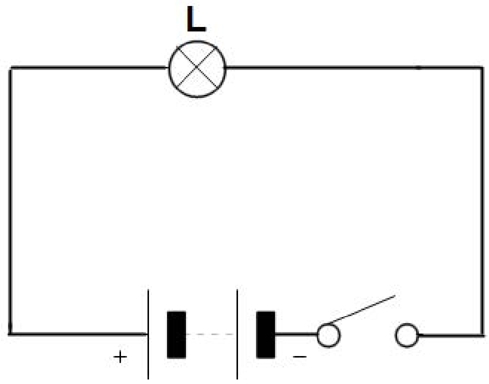

FIGURA 1

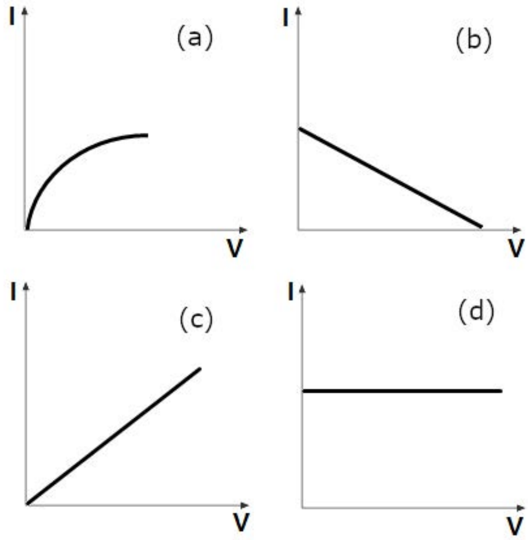

FIGURA 2

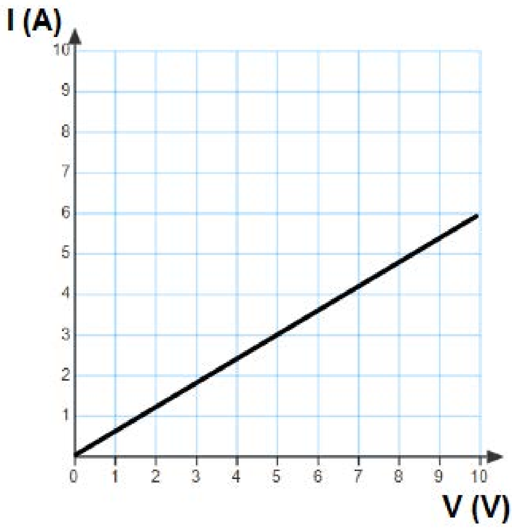

FIGURA 3

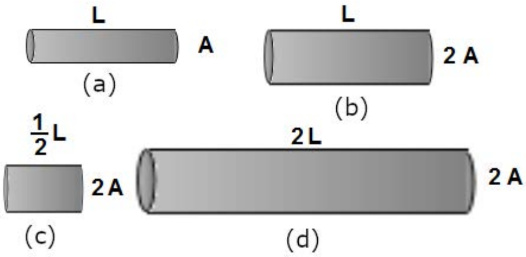

FIGURA 4

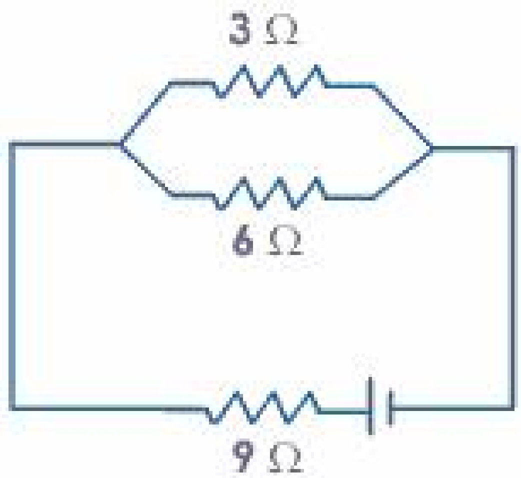

FIGURA 5

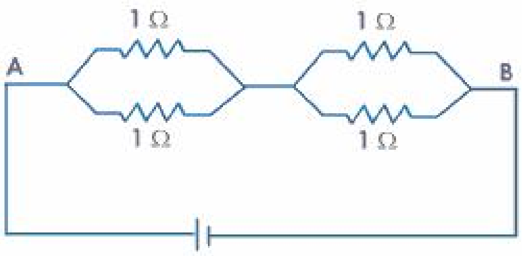

FIGURA 6

Buon compito ☺

LICEO STATALE "NICCOLÒ MACHIAVELLI" DI ROMA
5° anno – Verifica di Fisica n. 2 – CLIL Electric Currents

VERSIONE ♡1

DATA ____ CLASSE ____

ALUNNO ____

IL PUNTEGGIO PER OGNI RISPOSTA CORRETTA È DI 4 PUNTI, PER OGNI RISPOSTA OMESSA 1 PUNTO, PER OGNI RISPOSTA SBAGLIATA 0 PUNTI. LA DURATA DELLA VERIFICA È DI UN'ORA. SI SUGGERISCE DI RICOPIARE LE RISPOSTE NELLA TABELLA A SEGUIRE O IN CASO DI DIFFICOLTÀ NELLA COPIA SE NE SEGNALI L'ASSENZA.

TABELLA DELLE RISPOSTE									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

(1) TWO RESISTANCES OF 100 Ω AND ZERO OHM ARE CONNECTED IN PARALLEL. THE OVERALL RESISTANCE WILL BE:

- A 100 Ω.
- B 0 Ω.
- C 25 Ω.
- D 50 Ω.

(2) THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 1. COMPUTE THE POWER DISSIPATED IN THE RESISTOR WHEN THE APPLIED VOLTAGE IS 5 V.

A 5 W.

B 10 W.

C 20 W.

D 15 W.

(3) THE RESISTANCE OF AN ELECTRIC BULB DRAWING 1.2 A CURRENT AT 6.0 V IS:

A 5 W.

B 2 W.

C 0.5 W.

D 0.2 W.

(4) THE UNIT OF CURRENT IS:

A COULOMB.

B AMPERE.

C WATT.

D VOLT.

(5) IN FIGURE 2 AT THE END OF THE TEXT,

A 6 Ω, 3 Ω AND 9 Ω ARE IN SERIES.

B 3 Ω , 6 Ω AND Ω ARE IN PARALLEL.

C 3 Ω , 6 Ω ARE IN PARALLEL AND 9 Ω IS IN SERIES.

D 9 Ω AND 6 Ω ARE IN PARALLEL AND THE COMBINATION IS IN SERIES WITH 3 Ω.

(6) TWO ALUMINUM WIRES HAVE THE SAME LENGTH AND DIFFERENT CROSS-SECTIONAL AREA. WIRE B HAS TWICE THE RADIUS OF THAT OF WIRE A. DETERMINE HOW THE RESISTANCE OF WIRE B COMPARES TO THE RESISTANCE OF WIRE A.

A $\frac{R_B}{R_A} = \frac{1}{2}$.

B $\frac{R_B}{R_A} = \frac{2}{1}$.

C $\frac{R_B}{R_A} = \frac{1}{1}$.

D $\frac{R_B}{R_A} = \frac{1}{4}$.

(7) Three resistors $2\ \Omega$, $3\ \Omega$ and $4\ \Omega$ are connected so that the equivalent resistance is $9\ \Omega$. The resistors are connected:

- A $2\ \Omega$ and $3\ \Omega$ in series and the combination in parallel to $4\ \Omega$.
- B all in parallel.
- C all in series.
- D $2\ \Omega$ and $3\ \Omega$ in parallel and the combination in series with $4\ \Omega$.

(8) The unit of resistivity is:

- A ohm·m.
- B ohm.
- C ohm/m.
- D ohm/m^2.

(9) Heat produced in a current carrying wire in 5s is 60 J. The same current is passed through another wire of half the resistance. The heat produced in 5 s will be:

- A 60 J.
- B 120 J.
- C 30 J.
- D 15 J.

(10) Two resistors $R_1 = 6\ \Omega$ and $R_2 = 12\ \Omega$ are connected in parallel to each other and in series to $R_2 = 2\ \Omega$. Compute the net resistance in the circuit.

- A $1\ \Omega$.
- B $2\ \Omega$.
- C $6\ \Omega$.
- D $3\ \Omega$.

(11) Determine the direction of the conventional current through the light bulb in the circuit presented in Figure 3 at the end of the text.

- A To the right.
- B Downward.
- C To the left.
- D Upward.

⑫ THE WORK DONE IN MOVING A UNIT POSITIVE CHARGE ACROSS TWO POINTS IN AN ELECTRIC CIRCUIT IS A MEASURE OF:

- A CURRENT.
- B POWER.
- C RESISTANCE.
- D POTENTIAL DIFFERENCE.

⑬ A 10 A CURRENT IS MAINTAINED IN A SIMPLE CIRCUIT. COMPUTE THE NET CHARGE THAT PASSES THROUGH ANY POINT IN THE CIRCUIT DURING A 1 MINUTE INTERVAL.

- A 400 C.
- B 600 C.
- C 500 C.
- D 200 C.

⑭ TWO RESISTANCES OF 100 Ω AND ZERO OHM ARE CONNECTED IN SERIES. THE OVERALL RESISTANCE WILL BE:

- A 25 Ω.
- B 100 Ω.
- C 50 Ω.
- D 0 Ω.

⑮ THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 1. COMPUTE THE RESISTANCE OF THE WIRE.

- A 0.4 Ω.
- B 1.7 Ω.
- C 1 Ω.
- D 0.8 Ω.

⑯ DETERMINE WHICH ONE OF THE FOLLOWING STATEMENTS CONCERNING RESISTORS IN SERIES IS *true*.

- A THE POWER DISSIPATED BY EACH RESISTOR IS THE SAME.
- B THE TOTAL CURRENT THROUGH THE RESISTORS IS THE SUM OF THE CURRENT THROUGH EACH RESISTOR.
- C THE VOLTAGE ACROSS EACH RESISTOR IS THE SAME.
- D THE CURRENT THROUGH EACH RESISTOR IS THE SAME.

(17) In Figure 4 at the end of the text, the resistance across AB is:

- [A] 4 Ω.
- [B] 2 Ω.
- [C] 0.5 Ω.
- [D] 1 Ω.

(18) Two copper wires have the same cross-sectional area but have different lengths. Wire X has a length L and wire Y has a length $2L$. The ratio between the resistance of wire Y and wire X is:

- [A] $\frac{R_Y}{R_X} = \frac{1}{2}$.
- [B] $\frac{R_Y}{R_X} = \frac{1}{1}$.
- [C] $\frac{R_Y}{R_X} = \frac{1}{4}$.
- [D] $\frac{R_Y}{R_X} = \frac{2}{1}$.

(19) A positive charge released from rest:

- [A] moves towards the regions of higher potential.
- [B] moves towards the regions of equal potential.
- [C] does not move.
- [D] moves towards the regions of lower potential.

(20) The amount of charge flowing through a cross-sectional area of a wire per unit of time is called:

- [A] Voltage.
- [B] Resistance.
- [C] Current.
- [D] Power.

(21) All of the wires in Figure 5 at the end of the text are made of the same material but are different sizes. Identify the wire with the lowest resistance.

- [A] (a).
- [B] (b).
- [C] (d).
- [D] (c).

(22) WHEN THERE IS AN ELECTRIC CURRENT PASSING THROUGH A WIRE, THE PARTICLES MOVING ARE:

- A IONS.
- B ATOMS.
- C PROTONS.
- D ELECTRONS.

(23) COMPLETE THE FOLLOWING STATEMENT: "THE ELECTROMOTIVE FORCE IS:

- A THE MAXIMUM ELECTRIC POTENTIAL ENERGY STORED WITHIN A BATTERY".
- B THE MAXIMUM POTENTIAL DIFFERENCE BETWEEN THE TERMINALS OF A BATTERY".
- C THE FORCE THAT ACCELERATES ELECTRONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".
- D THE FORCE THAT ACCELERATES PROTONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".

(24) JOULE/COULOMB IS SAME AS:

- A OHM.
- B AMPERE.
- C VOLT.
- D WATT.

(25) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A RESISTOR WITH RESISTANCE F, THE POWER DISSIPATED BY THE RESISTOR IS DESCRIBED BY THE FORMULA:

- A $D \cdot F^2$.
- B $D \cdot F$.
- C D^2/F.
- D $D^2 \cdot F$.

(26) DETERMINE WHICH ONE OF THE FOLLOWING STATEMENTS CONCERNING RESISTORS IN PARALLEL IS *true*.

- A THE CURRENT THROUGH EACH RESISTOR IS THE SAME.
- B THE VOLTAGE ACROSS EACH RESISTOR IS THE SAME.
- C THE POWER DISSIPATED BY EACH RESISTOR IS THE SAME.
- D THE TOTAL VOLTAGE ACROSS THE RESISTORS IS THE SUM OF THE VOLTAGE ACROSS EACH RESISTOR.

(27) DETERMINE WHICH OF THE FOLLOWING STATEMENTS DOES NOT REPRESENT OHM'S LAW.

- [A] CURRENT = RESISTANCE $\times$ POTENTIAL DIFFERENCE.
- [B] CURRENT / POTENTIAL DIFFERENCE = CONSTANT.
- [C] POTENTIAL DIFFERENCE / CURRENT = CONSTANT.
- [D] POTENTIAL DIFFERENCE = CURRENT $\times$ RESISTANCE.

(28) THE POTENTIAL DIFFERENCE REQUIRED TO PASS A CURRENT 0.2 A IN A WIRE OF RESISTANCE $20\ \Omega$ IS:

- [A] 100 V.
- [B] 40 V.
- [C] 1 V.
- [D] 4 V.

(29) THE UNIT OF ELECTRIC POWER IS:

- [A] AMPERE.
- [B] VOLT.
- [C] WATT.
- [D] JOULE.

(30) COMPUTE THE NUMBER OF ELECTRONS FLOWING THROUGH A BATTERY THAT DELIVERS A CURRENT OF 3.0 A FOR 12 S.

- [A] 36.
- [B] 6.4×10^{18}.
- [C] 4.8×10^{15}.
- [D] 2.2×10^{20}.

(31) OHM'S LAW RELATES POTENTIAL DIFFERENCE WITH:

- [A] ENERGY.
- [B] TIME.
- [C] POWER.
- [D] CURRENT.

(32) A BATTERY IS USED TO:

- A MEASURE ELECTRIC POTENTIAL.
- B SAFEGUARD AGAINST SHORT-CIRCUIT.
- C MEASURE ELECTRIC CURRENT.
- D MAINTAIN A POTENTIAL DIFFERENCE.

(33) THE CURRENT IN A WIRE:

- A DEPENDS ONLY ON THE POTENTIAL DIFFERENCE APPLIED.
- B DOES NOT DEPEND ON RESISTANCE AND POTENTIAL DIFFERENCE.
- C DEPENDS ON BOTH RESISTANCE AND POTENTIAL DIFFERENCE.
- D DEPENDS ONLY ON THE RESISTANCE OF THE WIRE.

(34) DETERMINE WHICH OF THE GRAPHS IN FIGURE 6 AT THE END OF THE TEXT REPRESENTS OHM'S LAW FOR A SOLID CONDUCTOR.

- A (B).
- B (A).
- C (C).
- D (D).

(35) TWO RESISTORS $R_1 = 3\ \Omega$ AND $R_2 = 6\ \Omega$ ARE CONNECTED IN PARALLEL. COMPUTE THE NET RESISTANCE IN THE CIRCUIT.

- A $1\ \Omega$.
- B $3\ \Omega$.
- C $2\ \Omega$.
- D $6\ \Omega$.

(36) THE RESISTIVITY OF A WIRE DEPENDS ON:

- A LENGTH.
- B AREA OF CROSS-SECTION.
- C LENGTH, MATERIAL AND AREA OF CROSS-SECTION.
- D MATERIAL.

(37) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A CONDUCTOR AND P IS THE VOLTAGE ACROSS THE CONDUCTOR, THE POWER DISSIPATED IS DESCRIBED BY THE FORMULA:

A D^2/P.

B $D^2 \cdot P$.

C $D \cdot P^2$.

D $D \cdot P$.

(38) A WIRE OF LENGTH L AND CROSS-SECTIONAL AREA A HAS A RESISTIVITY ρ. DETERMINE WHICH OF THE FOLLOWING FORMULAS CAN BE USED TO CALCULATE THE RESISTANCE OF THE WIRE.

A $R = \dfrac{A}{\rho L}$.

B $R = \dfrac{\rho L}{A}$.

C $R = \dfrac{\rho A}{L}$.

D $R = \dfrac{L}{\rho A}$.

(39) WHEN A CURRENT I FLOWS THROUGH A RESISTANCE R FOR TIME t THE ELECTRICAL ENERGY SPENT IS GIVEN BY:

A IRt.

B IR^2t.

C I^2R/t.

D I^2Rt.

(40) THREE EQUAL RESISTANCES WHEN COMBINED IN SERIES ARE EQUIVALENT TO 90 Ω. THEIR EQUIVALENT RESISTANCE WHEN COMBINED IN PARALLEL WILL BE:

A 30 Ω.

B 270 Ω.

C 810 Ω.

D 10 Ω.

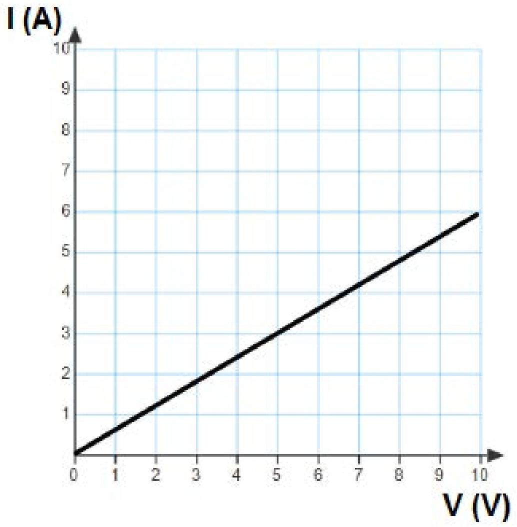

FIGURA 1

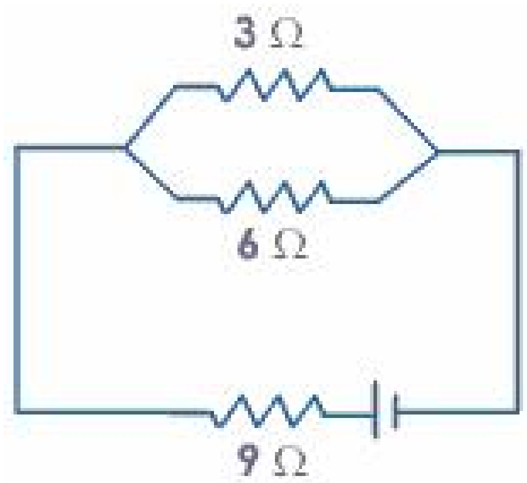

FIGURA 2

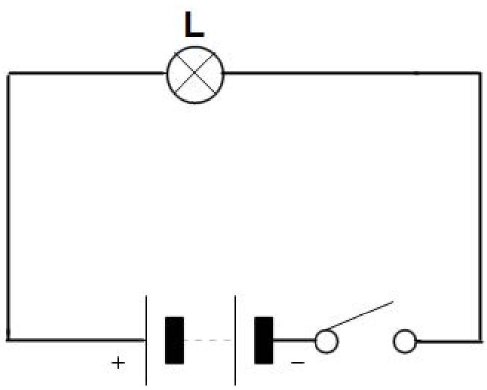

FIGURA 3

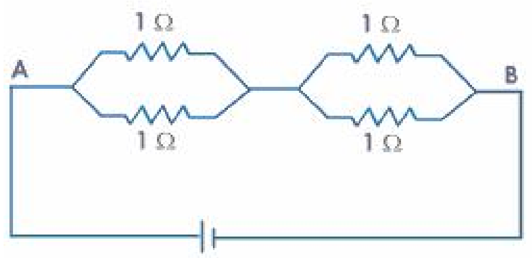

FIGURA 4

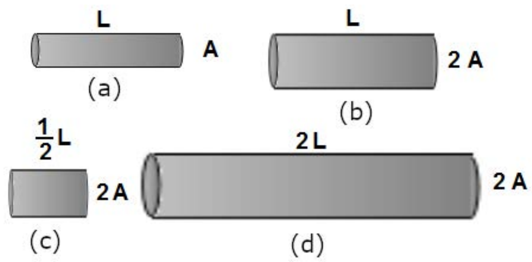

FIGURA 5

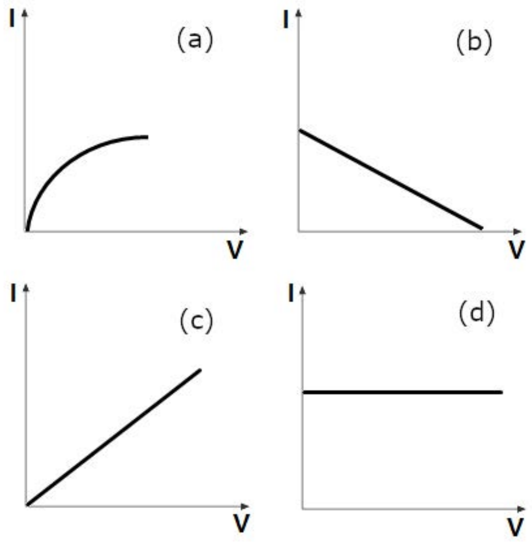

FIGURA 6

Buon compito ☺

LICEO STATALE "NICCOLÒ MACHIAVELLI" DI ROMA
5° anno – Verifica di Fisica n. 2 – CLIL Electric Currents

VERSIONE ♡2

DATA [ ] CLASSE [ ]

ALUNNO [ ]

IL PUNTEGGIO PER OGNI RISPOSTA CORRETTA È DI 4 PUNTI, PER OGNI RISPOSTA OMESSA 1 PUNTO, PER OGNI RISPOSTA SBAGLIATA 0 PUNTI. LA DURATA DELLA VERIFICA È DI UN'ORA. SI SUGGERISCE DI RICOPIARE LE RISPOSTE NELLA TABELLA A SEGUIRE O IN CASO DI DIFFICOLTÀ NELLA COPIA SE NE SEGNALI L'ASSENZA.

TABELLA DELLE RISPOSTE									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

(1) A WIRE OF LENGTH L AND CROSS-SECTIONAL AREA A HAS A RESISTIVITY ρ. DETERMINE WHICH OF THE FOLLOWING FORMULAS CAN BE USED TO CALCULATE THE RESISTANCE OF THE WIRE.

- A $R = \dfrac{\rho L}{A}$.
- B $R = \dfrac{\rho A}{L}$.
- C $R = \dfrac{L}{\rho A}$.
- D $R = \dfrac{A}{\rho L}$.

(2) DETERMINE THE DIRECTION OF THE CONVENTIONAL CURRENT THROUGH THE LIGHT BULB IN THE CIRCUIT PRESENTED IN FIGURE 1 AT THE END OF THE TEXT.

A TO THE LEFT.

B TO THE RIGHT.

C DOWNWARD.

D UPWARD.

(3) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A CONDUCTOR AND P IS THE VOLTAGE ACROSS THE CONDUCTOR, THE POWER DISSIPATED IS DESCRIBED BY THE FORMULA:

A $D \cdot P^2$.

B $D \cdot P$.

C D^2/P.

D $D^2 \cdot P$.

(4) IN FIGURE 2 AT THE END OF THE TEXT,

A 9 Ω AND 6 Ω ARE IN PARALLEL AND THE COMBINATION IS IN SERIES WITH 3 Ω.

B 6 Ω, 3 Ω AND 9 Ω ARE IN SERIES.

C 3 Ω , 6 Ω AND Ω ARE IN PARALLEL.

D 3 Ω , 6 Ω ARE IN PARALLEL AND 9 Ω IS IN SERIES.

(5) A BATTERY IS USED TO:

A MEASURE ELECTRIC POTENTIAL.

B SAFEGUARD AGAINST SHORT-CIRCUIT.

C MAINTAIN A POTENTIAL DIFFERENCE.

D MEASURE ELECTRIC CURRENT.

(6) THE UNIT OF CURRENT IS:

A COULOMB.

B AMPERE.

C VOLT.

D WATT.

(7) A positive charge released from rest:

- A moves towards the regions of higher potential.
- B moves towards the regions of equal potential.
- C does not move.
- D moves towards the regions of lower potential.

(8) Three equal resistances when combined in series are equivalent to 90 Ω. Their equivalent resistance when combined in parallel will be:

- A 270 Ω.
- B 810 Ω.
- C 10 Ω.
- D 30 Ω.

(9) If D is the intensity of current circulating in a resistor with resistance F, the power dissipated by the resistor is described by the formula:

- A $D^2 \cdot F$.
- B $D \cdot F^2$.
- C D^2/F.
- D $D \cdot F$.

(10) The resistance of an electric bulb drawing 1.2 A current at 6.0 V is:

- A 2 W.
- B 0.5 W.
- C 0.2 W.
- D 5 W.

(11) The electric current as a function of voltage of a wire is presented by the graph in Figure 3. Compute the resistance of the wire.

- A 0.8 Ω.
- B 0.4 Ω.
- C 1.7 Ω.
- D 1 Ω.

(12) Determine which of the graphs in Figure 4 at the end of the text represents Ohm's law for a solid conductor.

- A (c).
- B (d).
- C (a).
- D (b).

(13) When a current I flows through a resistance R for time t the electrical energy spent is given by:

- A I^2Rt.
- B IRt.
- C IR^2t.
- D I^2R/t.

(14) Two resistances of 100 Ω and zero ohm are connected in parallel. The overall resistance will be:

- A 50 Ω.
- B 0 Ω.
- C 25 Ω.
- D 100 Ω.

(15) The amount of charge flowing through a cross-sectional area of a wire per unit of time is called:

- A Voltage.
- B Power.
- C Resistance.
- D Current.

(16) Determine which one of the following statements concerning resistors in series is *true*.

- A The power dissipated by each resistor is the same.
- B The current through each resistor is the same.
- C The voltage across each resistor is the same.
- D The total current through the resistors is the sum of the current through each resistor.

(17) In Figure 5 at the end of the text, the resistance across *AB* is:

A 4 Ω.

B 2 Ω.

C 1 Ω.

D 0.5 Ω.

(18) Three resistors 2 Ω , 3 Ω and 4 Ω are connected so that the equivalent resistance is 9 Ω. The resistors are connected:

A 2 Ω and 3 Ω in series and the combination in parallel to 4 Ω.

B all in parallel.

C 2 Ω and 3 Ω in parallel and the combination in series with 4 Ω.

D all in series.

(19) Heat produced in a current carrying wire in 5s is 60 J. The same current is passed through another wire of half the resistance. The heat produced in 5 s will be:

A 120 J.

B 15 J.

C 30 J.

D 60 J.

(20) The potential difference required to pass a current 0.2 A in a wire of resistance 20 Ω is:

A 40 V.

B 1 V.

C 100 V.

D 4 V.

(21) Determine which one of the following statements concerning resistors in parallel is *true*.

A The voltage across each resistor is the same.

B The power dissipated by each resistor is the same.

C The total voltage across the resistors is the sum of the voltage across each resistor.

D The current through each resistor is the same.

(22) OHM'S LAW RELATES POTENTIAL DIFFERENCE WITH:

A POWER.

B CURRENT.

C ENERGY.

D TIME.

(23) THE UNIT OF RESISTIVITY IS:

A OHM.

B OHM/M^2.

C OHM·M.

D OHM/M.

(24) TWO COPPER WIRES HAVE THE SAME CROSS-SECTIONAL AREA BUT HAVE DIFFERENT LENGTHS. WIRE X HAS A LENGTH L AND WIRE Y HAS A LENGTH $2L$. THE RATIO BETWEEN THE RESISTANCE OF WIRE Y AND WIRE X IS:

A $\frac{R_Y}{R_X} = \frac{1}{2}$.

B $\frac{R_Y}{R_X} = \frac{2}{1}$.

C $\frac{R_Y}{R_X} = \frac{1}{4}$.

D $\frac{R_Y}{R_X} = \frac{1}{1}$.

(25) JOULE/COULOMB IS SAME AS:

A WATT.

B AMPERE.

C OHM.

D VOLT.

(26) A 10 A CURRENT IS MAINTAINED IN A SIMPLE CIRCUIT. COMPUTE THE NET CHARGE THAT PASSES THROUGH ANY POINT IN THE CIRCUIT DURING A 1 MINUTE INTERVAL.

A 200 C.

B 600 C.

C 400 C.

D 500 C.

(27) COMPLETE THE FOLLOWING STATEMENT: "THE ELECTROMOTIVE FORCE IS:

- A THE MAXIMUM POTENTIAL DIFFERENCE BETWEEN THE TERMINALS OF A BATTERY".
- B THE FORCE THAT ACCELERATES PROTONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".
- C THE MAXIMUM ELECTRIC POTENTIAL ENERGY STORED WITHIN A BATTERY".
- D THE FORCE THAT ACCELERATES ELECTRONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".

(28) THE WORK DONE IN MOVING A UNIT POSITIVE CHARGE ACROSS TWO POINTS IN AN ELECTRIC CIRCUIT IS A MEASURE OF:

- A CURRENT.
- B RESISTANCE.
- C POTENTIAL DIFFERENCE.
- D POWER.

(29) TWO RESISTORS $R_1 = 3\ \Omega$ AND $R_2 = 6\ \Omega$ ARE CONNECTED IN PARALLEL. COMPUTE THE NET RESISTANCE IN THE CIRCUIT.

- A $3\ \Omega$.
- B $6\ \Omega$.
- C $1\ \Omega$.
- D $2\ \Omega$.

(30) TWO RESISTANCES OF $100\ \Omega$ AND ZERO OHM ARE CONNECTED IN SERIES. THE OVERALL RESISTANCE WILL BE:

- A $100\ \Omega$.
- B $0\ \Omega$.
- C $50\ \Omega$.
- D $25\ \Omega$.

(31) WHEN THERE IS AN ELECTRIC CURRENT PASSING THROUGH A WIRE, THE PARTICLES MOVING ARE:

- A IONS.
- B ATOMS.
- C ELECTRONS.
- D PROTONS.

(32) COMPUTE THE NUMBER OF ELECTRONS FLOWING THROUGH A BATTERY THAT DELIVERS A CURRENT OF 3.0 A FOR 12 S.

- A 4.8×10^{15}.
- B 2.2×10^{20}.
- C 36.
- D 6.4×10^{18}.

(33) THE CURRENT IN A WIRE:

- A DEPENDS ONLY ON THE POTENTIAL DIFFERENCE APPLIED.
- B DOES NOT DEPEND ON RESISTANCE AND POTENTIAL DIFFERENCE.
- C DEPENDS ON BOTH RESISTANCE AND POTENTIAL DIFFERENCE.
- D DEPENDS ONLY ON THE RESISTANCE OF THE WIRE.

(34) ALL OF THE WIRES IN FIGURE 6 AT THE END OF THE TEXT ARE MADE OF THE SAME MATERIAL BUT ARE DIFFERENT SIZES. IDENTIFY THE WIRE WITH THE LOWEST RESISTANCE.

- A (A).
- B (D).
- C (B).
- D (C).

(35) DETERMINE WHICH OF THE FOLLOWING STATEMENTS DOES NOT REPRESENT OHM'S LAW.

- A CURRENT / POTENTIAL DIFFERENCE = CONSTANT.
- B CURRENT = RESISTANCE × POTENTIAL DIFFERENCE.
- C POTENTIAL DIFFERENCE = CURRENT × RESISTANCE.
- D POTENTIAL DIFFERENCE / CURRENT = CONSTANT.

(36) THE UNIT OF ELECTRIC POWER IS:

- A WATT.
- B VOLT.
- C AMPERE.
- D JOULE.

(37) TWO RESISTORS $R_1 = 6\ \Omega$ AND $R_2 = 12\ \Omega$ ARE CONNECTED IN PARALLEL TO EACH OTHER AND IN SERIES TO $R_2 = 2\ \Omega$. COMPUTE THE NET RESISTANCE IN THE CIRCUIT.

- A $3\ \Omega$.
- B $6\ \Omega$.
- C $2\ \Omega$.
- D $1\ \Omega$.

(38) TWO ALUMINUM WIRES HAVE THE SAME LENGTH AND DIFFERENT CROSS-SECTIONAL AREA. WIRE B HAS TWICE THE RADIUS OF THAT OF WIRE A. DETERMINE HOW THE RESISTANCE OF WIRE B COMPARES TO THE RESISTANCE OF WIRE A.

- A $\frac{R_B}{R_A} = \frac{1}{1}$.
- B $\frac{R_B}{R_A} = \frac{1}{2}$.
- C $\frac{R_B}{R_A} = \frac{2}{1}$.
- D $\frac{R_B}{R_A} = \frac{1}{4}$.

(39) THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 3. COMPUTE THE POWER DISSIPATED IN THE RESISTOR WHEN THE APPLIED VOLTAGE IS 5 V.

- A 20 W.
- B 5 W.
- C 10 W.
- D 15 W.

(40) THE RESISTIVITY OF A WIRE DEPENDS ON:

- A AREA OF CROSS-SECTION.
- B LENGTH.
- C LENGTH, MATERIAL AND AREA OF CROSS-SECTION.
- D MATERIAL.

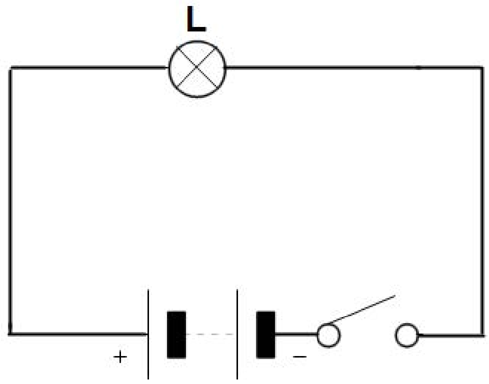

FIGURA 1

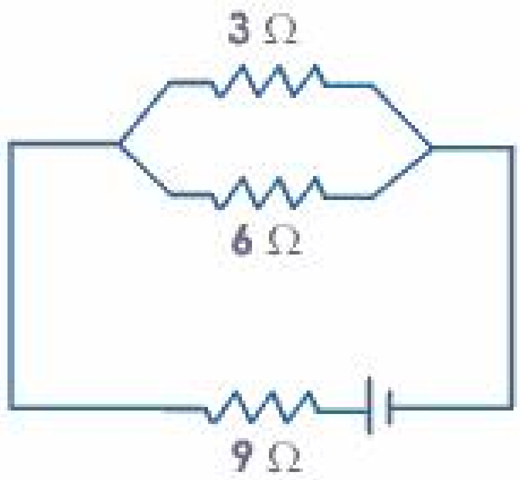

FIGURA 2

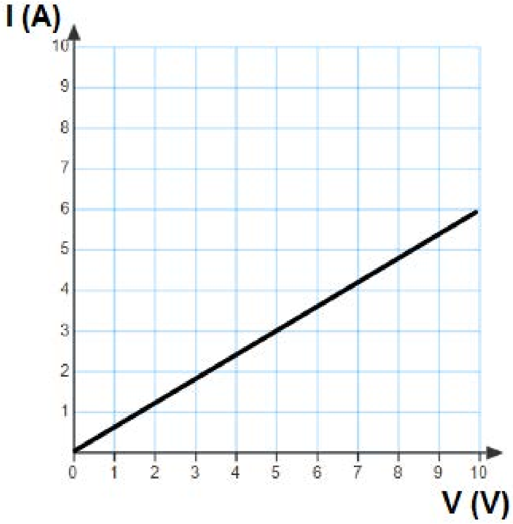

FIGURA 3

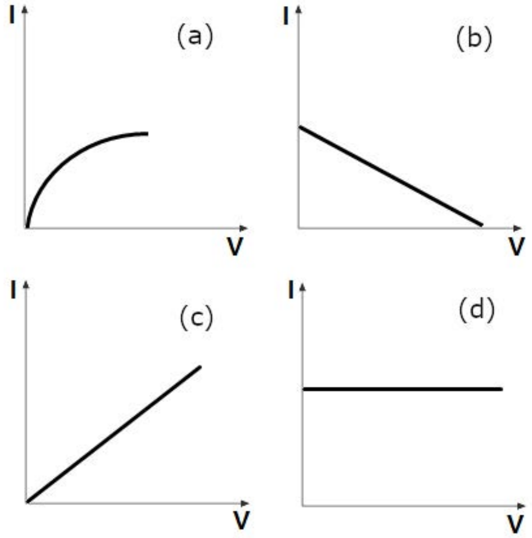

FIGURA 4

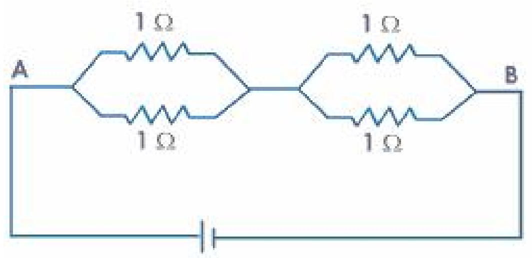

FIGURA 5

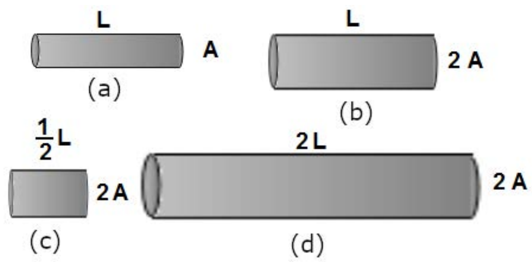

FIGURA 6

Buon compito ☺

Liceo Statale “Niccolò Machiavelli” di Roma
5° anno – Verifica di Fisica n. 2 – CLIL Electric Currents

Versione ♡3

Data [ ] Classe [ ]

Alunno [ ]

Il punteggio per ogni risposta corretta è di 4 punti, per ogni risposta omessa 1 punto, per ogni risposta sbagliata 0 punti. La durata della verifica è di un'ora. Si suggerisce di ricopiare le risposte nella tabella a seguire o in caso di difficoltà nella copia se ne segnali l'assenza.

Tabella delle risposte									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

1. Two resistors $R_1 = 3\ \Omega$ and $R_2 = 6\ \Omega$ are connected in parallel. Compute the net resistance in the circuit.

   A. $6\ \Omega$.

   B. $2\ \Omega$.

   C. $3\ \Omega$.

   D. $1\ \Omega$.

(2) THE RESISTANCE OF AN ELECTRIC BULB DRAWING 1.2 A CURRENT AT 6.0 V IS:

- A 0.5 W.
- B 5 W.
- C 0.2 W.
- D 2 W.

(3) THE AMOUNT OF CHARGE FLOWING THROUGH A CROSS-SECTIONAL AREA OF A WIRE PER UNIT OF TIME IS CALLED:

- A VOLTAGE.
- B CURRENT.
- C POWER.
- D RESISTANCE.

(4) IN FIGURE 1 AT THE END OF THE TEXT, THE RESISTANCE ACROSS *AB* IS:

- A 1 Ω.
- B 4 Ω.
- C 0.5 Ω.
- D 2 Ω.

(5) THREE EQUAL RESISTANCES WHEN COMBINED IN SERIES ARE EQUIVALENT TO 90 Ω. THEIR EQUIVALENT RESISTANCE WHEN COMBINED IN PARALLEL WILL BE:

- A 10 Ω.
- B 270 Ω.
- C 810 Ω.
- D 30 Ω.

(6) OHM'S LAW RELATES POTENTIAL DIFFERENCE WITH:

- A CURRENT.
- B ENERGY.
- C TIME.
- D POWER.

(7) Determine which one of the following statements concerning resistors in series is *true*.

[A] The power dissipated by each resistor is the same.

[B] The total current through the resistors is the sum of the current through each resistor.

[C] The voltage across each resistor is the same.

[D] The current through each resistor is the same.

(8) The potential difference required to pass a current 0.2 A in a wire of resistance 20 Ω is:

[A] 40 V.

[B] 100 V.

[C] 4 V.

[D] 1 V.

(9) A wire of length L and cross-sectional area A has a resistivity ρ. Determine which of the following formulas can be used to calculate the resistance of the wire.

[A] $R = \dfrac{A}{\rho L}$.

[B] $R = \dfrac{\rho L}{A}$.

[C] $R = \dfrac{L}{\rho A}$.

[D] $R = \dfrac{\rho A}{L}$.

(10) Three resistors 2 Ω , 3 Ω and 4 Ω are connected so that the equivalent resistance is 9 Ω. The resistors are connected:

[A] all in parallel.

[B] 2 Ω and 3 Ω in series and the combination in parallel to 4 Ω.

[C] 2 Ω and 3 Ω in parallel and the combination in series with 4 Ω.

[D] all in series.

(11) The unit of current is:

[A] ampere.

[B] coulomb.

[C] volt.

[D] watt.

⑫ DETERMINE WHICH OF THE GRAPHS IN FIGURE 2 AT THE END OF THE TEXT REPRESENTS OHM'S LAW FOR A SOLID CONDUCTOR.

- [A] (A).
- [B] (C).
- [C] (D).
- [D] (B).

⑬ THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 3. COMPUTE THE POWER DISSIPATED IN THE RESISTOR WHEN THE APPLIED VOLTAGE IS 5 V.

- [A] 10 W.
- [B] 5 W.
- [C] 20 W.
- [D] 15 W.

⑭ DETERMINE WHICH OF THE FOLLOWING STATEMENTS DOES NOT REPRESENT OHM'S LAW.

- [A] POTENTIAL DIFFERENCE / CURRENT = CONSTANT.
- [B] CURRENT / POTENTIAL DIFFERENCE = CONSTANT.
- [C] POTENTIAL DIFFERENCE = CURRENT $\times$ RESISTANCE.
- [D] CURRENT = RESISTANCE $\times$ POTENTIAL DIFFERENCE.

⑮ A POSITIVE CHARGE RELEASED FROM REST:

- [A] MOVES TOWARDS THE REGIONS OF EQUAL POTENTIAL.
- [B] MOVES TOWARDS THE REGIONS OF LOWER POTENTIAL.
- [C] MOVES TOWARDS THE REGIONS OF HIGHER POTENTIAL.
- [D] DOES NOT MOVE.

⑯ IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A CONDUCTOR AND P IS THE VOLTAGE ACROSS THE CONDUCTOR, THE POWER DISSIPATED IS DESCRIBED BY THE FORMULA:

- [A] $D^2 \cdot P$.
- [B] $D \cdot P^2$.
- [C] D^2/P.
- [D] $D \cdot P$.

(17) WHEN A CURRENT I FLOWS THROUGH A RESISTANCE R FOR TIME t THE ELECTRICAL ENERGY SPENT IS GIVEN BY:

A IR^2t.

B I^2R/t.

C IRt.

D I^2Rt.

(18) WHEN THERE IS AN ELECTRIC CURRENT PASSING THROUGH A WIRE, THE PARTICLES MOVING ARE:

A ATOMS.

B ELECTRONS.

C IONS.

D PROTONS.

(19) A BATTERY IS USED TO:

A SAFEGUARD AGAINST SHORT-CIRCUIT.

B MEASURE ELECTRIC CURRENT.

C MEASURE ELECTRIC POTENTIAL.

D MAINTAIN A POTENTIAL DIFFERENCE.

(20) DETERMINE THE DIRECTION OF THE CONVENTIONAL CURRENT THROUGH THE LIGHT BULB IN THE CIRCUIT PRESENTED IN FIGURE 4 AT THE END OF THE TEXT.

A UPWARD.

B TO THE RIGHT.

C DOWNWARD.

D TO THE LEFT.

(21) IN FIGURE 5 AT THE END OF THE TEXT,

A 6 Ω, 3 Ω AND 9 Ω ARE IN SERIES.

B 3 Ω , 6 Ω AND Ω ARE IN PARALLEL.

C 9 Ω AND 6 Ω ARE IN PARALLEL AND THE COMBINATION IS IN SERIES WITH 3 Ω.

D 3 Ω , 6 Ω ARE IN PARALLEL AND 9 Ω IS IN SERIES.

(22) COMPUTE THE NUMBER OF ELECTRONS FLOWING THROUGH A BATTERY THAT DELIVERS A CURRENT OF 3.0 A FOR 12 S.

A 2.2×10^{20}.

B 4.8×10^{15}.

C 36.

D 6.4×10^{18}.

(23) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A RESISTOR WITH RESISTANCE F, THE POWER DISSIPATED BY THE RESISTOR IS DESCRIBED BY THE FORMULA:

A $D \cdot F^2$.

B D^2/F.

C $D^2 \cdot F$.

D $D \cdot F$.

(24) A 10 A CURRENT IS MAINTAINED IN A SIMPLE CIRCUIT. COMPUTE THE NET CHARGE THAT PASSES THROUGH ANY POINT IN THE CIRCUIT DURING A 1 MINUTE INTERVAL.

A 500 C.

B 600 C.

C 200 C.

D 400 C.

(25) THE CURRENT IN A WIRE:

A DEPENDS ONLY ON THE POTENTIAL DIFFERENCE APPLIED.

B DEPENDS ON BOTH RESISTANCE AND POTENTIAL DIFFERENCE.

C DOES NOT DEPEND ON RESISTANCE AND POTENTIAL DIFFERENCE.

D DEPENDS ONLY ON THE RESISTANCE OF THE WIRE.

(26) HEAT PRODUCED IN A CURRENT CARRYING WIRE IN 5S IS 60 J. THE SAME CURRENT IS PASSED THROUGH ANOTHER WIRE OF HALF THE RESISTANCE. THE HEAT PRODUCED IN 5 S WILL BE:

A 15 J.

B 120 J.

C 60 J.

D 30 J.

(27) THE UNIT OF ELECTRIC POWER IS:

- A WATT.
- B JOULE.
- C VOLT.
- D AMPERE.

(28) THE WORK DONE IN MOVING A UNIT POSITIVE CHARGE ACROSS TWO POINTS IN AN ELECTRIC CIRCUIT IS A MEASURE OF:

- A RESISTANCE.
- B POWER.
- C CURRENT.
- D POTENTIAL DIFFERENCE.

(29) TWO RESISTANCES OF 100 Ω AND ZERO OHM ARE CONNECTED IN PARALLEL. THE OVERALL RESISTANCE WILL BE:

- A 50 Ω.
- B 25 Ω.
- C 100 Ω.
- D 0 Ω.

(30) ALL OF THE WIRES IN FIGURE 6 AT THE END OF THE TEXT ARE MADE OF THE SAME MATERIAL BUT ARE DIFFERENT SIZES. IDENTIFY THE WIRE WITH THE LOWEST RESISTANCE.

- A (B).
- B (C).
- C (A).
- D (D).

(31) TWO RESISTANCES OF 100 Ω AND ZERO OHM ARE CONNECTED IN SERIES. THE OVERALL RESISTANCE WILL BE:

- A 0 Ω.
- B 100 Ω.
- C 25 Ω.
- D 50 Ω.

(32) THE RESISTIVITY OF A WIRE DEPENDS ON:

A MATERIAL.

B AREA OF CROSS-SECTION.

C LENGTH.

D LENGTH, MATERIAL AND AREA OF CROSS-SECTION.

(33) THE UNIT OF RESISTIVITY IS:

A OHM/M^2.

B OHM.

C OHM·M.

D OHM/M.

(34) TWO ALUMINUM WIRES HAVE THE SAME LENGTH AND DIFFERENT CROSS-SECTIONAL AREA. WIRE B HAS TWICE THE RADIUS OF THAT OF WIRE A. DETERMINE HOW THE RESISTANCE OF WIRE B COMPARES TO THE RESISTANCE OF WIRE A.

A $\frac{R_B}{R_A} = \frac{1}{2}$.

B $\frac{R_B}{R_A} = \frac{1}{1}$.

C $\frac{R_B}{R_A} = \frac{2}{1}$.

D $\frac{R_B}{R_A} = \frac{1}{4}$.

(35) DETERMINE WHICH ONE OF THE FOLLOWING STATEMENTS CONCERNING RESISTORS IN PARALLEL IS *true*.

A THE TOTAL VOLTAGE ACROSS THE RESISTORS IS THE SUM OF THE VOLTAGE ACROSS EACH RESISTOR.

B THE CURRENT THROUGH EACH RESISTOR IS THE SAME.

C THE POWER DISSIPATED BY EACH RESISTOR IS THE SAME.

D THE VOLTAGE ACROSS EACH RESISTOR IS THE SAME.

(36) TWO RESISTORS $R_1 = 6\ \Omega$ AND $R_2 = 12\ \Omega$ ARE CONNECTED IN PARALLEL TO EACH OTHER AND IN SERIES TO $R_2 = 2\ \Omega$. COMPUTE THE NET RESISTANCE IN THE CIRCUIT.

A $6\ \Omega$.

B $1\ \Omega$.

C $3\ \Omega$.

D $2\ \Omega$.

(37) JOULE/COULOMB IS SAME AS:

- A OHM.
- B VOLT.
- C WATT.
- D AMPERE.

(38) THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 3. COMPUTE THE RESISTANCE OF THE WIRE.

- A 1 Ω.
- B 0.8 Ω.
- C 0.4 Ω.
- D 1.7 Ω.

(39) TWO COPPER WIRES HAVE THE SAME CROSS-SECTIONAL AREA BUT HAVE DIFFERENT LENGTHS. WIRE X HAS A LENGTH L AND WIRE Y HAS A LENGTH $2L$. THE RATIO BETWEEN THE RESISTANCE OF WIRE Y AND WIRE X IS:

- A $\frac{R_Y}{R_X} = \frac{2}{1}$.
- B $\frac{R_Y}{R_X} = \frac{1}{1}$.
- C $\frac{R_Y}{R_X} = \frac{1}{4}$.
- D $\frac{R_Y}{R_X} = \frac{1}{2}$.

(40) COMPLETE THE FOLLOWING STATEMENT: "THE ELECTROMOTIVE FORCE IS:

- A THE MAXIMUM POTENTIAL DIFFERENCE BETWEEN THE TERMINALS OF A BATTERY".
- B THE MAXIMUM ELECTRIC POTENTIAL ENERGY STORED WITHIN A BATTERY".
- C THE FORCE THAT ACCELERATES PROTONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".
- D THE FORCE THAT ACCELERATES ELECTRONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".

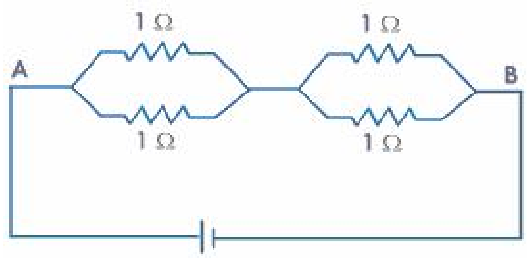

FIGURA 1

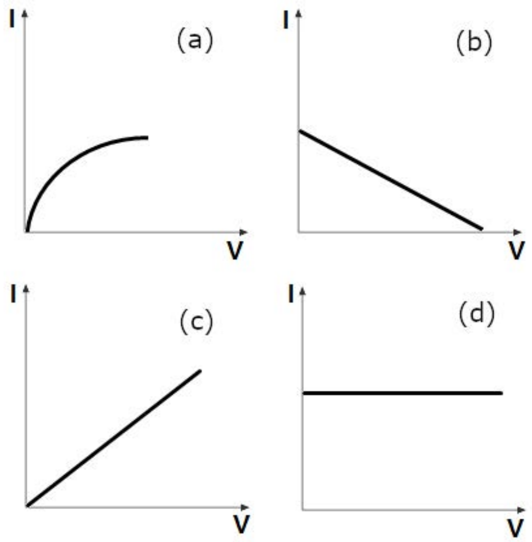

FIGURA 2

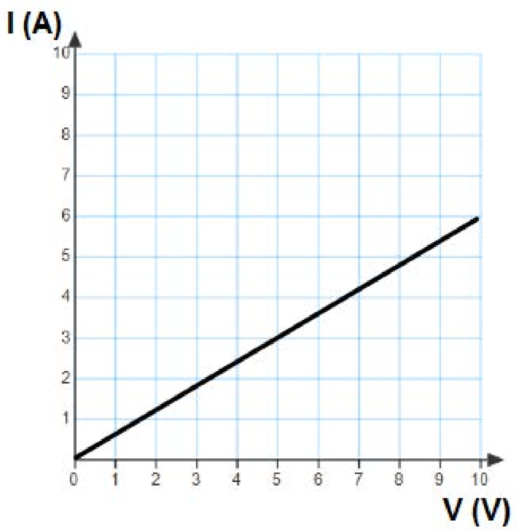

FIGURA 3

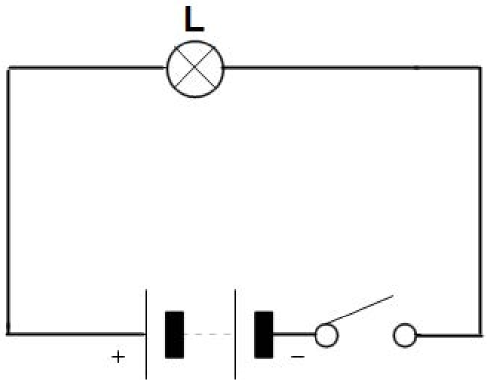

FIGURA 4

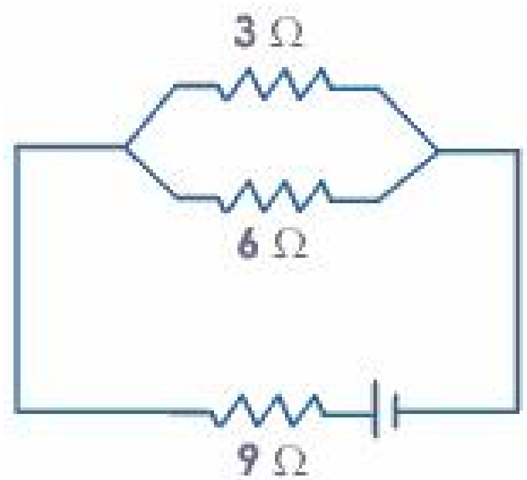

FIGURA 5

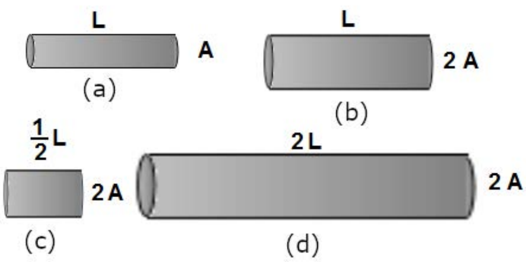

FIGURA 6

Buon compito ☺

Liceo Statale "Niccolò Machiavelli" di Roma
5° anno – Verifica di Fisica n. 2 – CLIL Electric Currents

Versione ♡4

Data ______ Classe ______

Alunno ______

Il punteggio per ogni risposta corretta è di 4 punti, per ogni risposta omessa 1 punto, per ogni risposta sbagliata 0 punti. La durata della verifica è di un'ora. Si suggerisce di ricopiare le risposte nella tabella a seguire o in caso di difficoltà nella copia se ne segnali l'assenza.

Tabella delle risposte									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

(1) The unit of electric power is:

- A joule.
- B volt.
- C watt.
- D ampere.

2. TWO RESISTORS $R_1 = 3\ \Omega$ AND $R_2 = 6\ \Omega$ ARE CONNECTED IN PARALLEL. COMPUTE THE NET RESISTANCE IN THE CIRCUIT.

   - A $1\ \Omega$.
   - B $3\ \Omega$.
   - C $2\ \Omega$.
   - D $6\ \Omega$.

3. TWO RESISTANCES OF $100\ \Omega$ AND ZERO OHM ARE CONNECTED IN SERIES. THE OVERALL RESISTANCE WILL BE:

   - A $50\ \Omega$.
   - B $0\ \Omega$.
   - C $25\ \Omega$.
   - D $100\ \Omega$.

4. DETERMINE WHICH OF THE GRAPHS IN FIGURE 1 AT THE END OF THE TEXT REPRESENTS OHM'S LAW FOR A SOLID CONDUCTOR.

   - A (D).
   - B (A).
   - C (B).
   - D (C).

5. THE CURRENT IN A WIRE:

   - A DEPENDS ON BOTH RESISTANCE AND POTENTIAL DIFFERENCE.
   - B DEPENDS ONLY ON THE RESISTANCE OF THE WIRE.
   - C DEPENDS ONLY ON THE POTENTIAL DIFFERENCE APPLIED.
   - D DOES NOT DEPEND ON RESISTANCE AND POTENTIAL DIFFERENCE.

6. THE RESISTIVITY OF A WIRE DEPENDS ON:

   - A MATERIAL.
   - B AREA OF CROSS-SECTION.
   - C LENGTH, MATERIAL AND AREA OF CROSS-SECTION.
   - D LENGTH.

7. THE AMOUNT OF CHARGE FLOWING THROUGH A CROSS-SECTIONAL AREA OF A WIRE PER UNIT OF TIME IS CALLED:

   A. POWER.
   B. CURRENT.
   C. VOLTAGE.
   D. RESISTANCE.

8. JOULE/COULOMB IS SAME AS:

   A. OHM.
   B. VOLT.
   C. WATT.
   D. AMPERE.

9. IN FIGURE 2 AT THE END OF THE TEXT,

   A. 6 Ω, 3 Ω AND 9 Ω ARE IN SERIES.
   B. 9 Ω AND 6 Ω ARE IN PARALLEL AND THE COMBINATION IS IN SERIES WITH 3 Ω.
   C. 3 Ω , 6 Ω ARE IN PARALLEL AND 9 Ω IS IN SERIES.
   D. 3 Ω , 6 Ω AND Ω ARE IN PARALLEL.

10. THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 3. COMPUTE THE POWER DISSIPATED IN THE RESISTOR WHEN THE APPLIED VOLTAGE IS 5 V.

   A. 20 W.
   B. 15 W.
   C. 10 W.
   D. 5 W.

11. WHEN A CURRENT I FLOWS THROUGH A RESISTANCE R FOR TIME t THE ELECTRICAL ENERGY SPENT IS GIVEN BY:

   A. IR^2t.
   B. I^2Rt.
   C. IRt.
   D. I^2R/t.

(12) THREE EQUAL RESISTANCES WHEN COMBINED IN SERIES ARE EQUIVALENT TO 90 Ω. THEIR EQUIVALENT RESISTANCE WHEN COMBINED IN PARALLEL WILL BE:

- A 270 Ω.
- B 810 Ω.
- C 30 Ω.
- D 10 Ω.

(13) A BATTERY IS USED TO:

- A MEASURE ELECTRIC POTENTIAL.
- B MEASURE ELECTRIC CURRENT.
- C MAINTAIN A POTENTIAL DIFFERENCE.
- D SAFEGUARD AGAINST SHORT-CIRCUIT.

(14) THE RESISTANCE OF AN ELECTRIC BULB DRAWING 1.2 A CURRENT AT 6.0 V IS:

- A 0.2 W.
- B 0.5 W.
- C 2 W.
- D 5 W.

(15) ALL OF THE WIRES IN FIGURE 4 AT THE END OF THE TEXT ARE MADE OF THE SAME MATERIAL BUT ARE DIFFERENT SIZES. IDENTIFY THE WIRE WITH THE LOWEST RESISTANCE.

- A (A).
- B (C).
- C (B).
- D (D).

(16) THE WORK DONE IN MOVING A UNIT POSITIVE CHARGE ACROSS TWO POINTS IN AN ELECTRIC CIRCUIT IS A MEASURE OF:

- A CURRENT.
- B POTENTIAL DIFFERENCE.
- C POWER.
- D RESISTANCE.

(17) COMPLETE THE FOLLOWING STATEMENT: "THE ELECTROMOTIVE FORCE IS:

- A THE MAXIMUM ELECTRIC POTENTIAL ENERGY STORED WITHIN A BATTERY".
- B THE FORCE THAT ACCELERATES PROTONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".
- C THE FORCE THAT ACCELERATES ELECTRONS THROUGH A WIRE WHEN A BATTERY IS CONNECTED TO IT".
- D THE MAXIMUM POTENTIAL DIFFERENCE BETWEEN THE TERMINALS OF A BATTERY".

(18) TWO ALUMINUM WIRES HAVE THE SAME LENGTH AND DIFFERENT CROSS-SECTIONAL AREA. WIRE B HAS TWICE THE RADIUS OF THAT OF WIRE A. DETERMINE HOW THE RESISTANCE OF WIRE B COMPARES TO THE RESISTANCE OF WIRE A.

- A $\frac{R_B}{R_A} = \frac{2}{1}$.
- B $\frac{R_B}{R_A} = \frac{1}{4}$.
- C $\frac{R_B}{R_A} = \frac{1}{2}$.
- D $\frac{R_B}{R_A} = \frac{1}{1}$.

(19) THREE RESISTORS $2\ \Omega$, $3\ \Omega$ AND $4\ \Omega$ ARE CONNECTED SO THAT THE EQUIVALENT RESISTANCE IS $9\ \Omega$. THE RESISTORS ARE CONNECTED:

- A ALL IN SERIES.
- B $2\ \Omega$ AND $3\ \Omega$ IN PARALLEL AND THE COMBINATION IN SERIES WITH $4\ \Omega$.
- C ALL IN PARALLEL.
- D $2\ \Omega$ AND $3\ \Omega$ IN SERIES AND THE COMBINATION IN PARALLEL TO $4\ \Omega$.

(20) A 10 A CURRENT IS MAINTAINED IN A SIMPLE CIRCUIT. COMPUTE THE NET CHARGE THAT PASSES THROUGH ANY POINT IN THE CIRCUIT DURING A 1 MINUTE INTERVAL.

- A 500 C.
- B 400 C.
- C 200 C.
- D 600 C.

(21) TWO RESISTORS $R_1 = 6\ \Omega$ AND $R_2 = 12\ \Omega$ ARE CONNECTED IN PARALLEL TO EACH OTHER AND IN SERIES TO $R_2 = 2\ \Omega$. COMPUTE THE NET RESISTANCE IN THE CIRCUIT.

- A $1\ \Omega$.
- B $2\ \Omega$.
- C $3\ \Omega$.
- D $6\ \Omega$.

(22) A POSITIVE CHARGE RELEASED FROM REST:

- A MOVES TOWARDS THE REGIONS OF LOWER POTENTIAL.
- B DOES NOT MOVE.
- C MOVES TOWARDS THE REGIONS OF HIGHER POTENTIAL.
- D MOVES TOWARDS THE REGIONS OF EQUAL POTENTIAL.

(23) OHM'S LAW RELATES POTENTIAL DIFFERENCE WITH:

- A TIME.
- B ENERGY.
- C CURRENT.
- D POWER.

(24) COMPUTE THE NUMBER OF ELECTRONS FLOWING THROUGH A BATTERY THAT DELIVERS A CURRENT OF 3.0 A FOR 12 S.

- A 2.2×10^{20}.
- B 36.
- C 4.8×10^{15}.
- D 6.4×10^{18}.

(25) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A CONDUCTOR AND P IS THE VOLTAGE ACROSS THE CONDUCTOR, THE POWER DISSIPATED IS DESCRIBED BY THE FORMULA:

- A $D^2 \cdot P$.
- B D^2/P.
- C $D \cdot P^2$.
- D $D \cdot P$.

(26) DETERMINE WHICH OF THE FOLLOWING STATEMENTS DOES NOT REPRESENT OHM'S LAW.

- A POTENTIAL DIFFERENCE / CURRENT = CONSTANT.
- B CURRENT / POTENTIAL DIFFERENCE = CONSTANT.
- C POTENTIAL DIFFERENCE = CURRENT $\times$ RESISTANCE.
- D CURRENT = RESISTANCE $\times$ POTENTIAL DIFFERENCE.

(27) THE UNIT OF RESISTIVITY IS:

- A OHM.
- B OHM/M.
- C OHM·M.
- D OHM/M^2.

(28) IN FIGURE 5 AT THE END OF THE TEXT, THE RESISTANCE ACROSS AB IS:

- A 2 Ω.
- B 1 Ω.
- C 0.5 Ω.
- D 4 Ω.

(29) HEAT PRODUCED IN A CURRENT CARRYING WIRE IN 5S IS 60 J. THE SAME CURRENT IS PASSED THROUGH ANOTHER WIRE OF HALF THE RESISTANCE. THE HEAT PRODUCED IN 5 S WILL BE:

- A 15 J.
- B 30 J.
- C 120 J.
- D 60 J.

(30) IF D IS THE INTENSITY OF CURRENT CIRCULATING IN A RESISTOR WITH RESISTANCE F, THE POWER DISSIPATED BY THE RESISTOR IS DESCRIBED BY THE FORMULA:

- A $D \cdot F$.
- B D^2/F.
- C $D^2 \cdot F$.
- D $D \cdot F^2$.

(31) DETERMINE WHICH ONE OF THE FOLLOWING STATEMENTS CONCERNING RESISTORS IN PARALLEL IS *true*.

A THE POWER DISSIPATED BY EACH RESISTOR IS THE SAME.

B THE CURRENT THROUGH EACH RESISTOR IS THE SAME.

C THE VOLTAGE ACROSS EACH RESISTOR IS THE SAME.

D THE TOTAL VOLTAGE ACROSS THE RESISTORS IS THE SUM OF THE VOLTAGE ACROSS EACH RESISTOR.

(32) WHEN THERE IS AN ELECTRIC CURRENT PASSING THROUGH A WIRE, THE PARTICLES MOVING ARE:

A PROTONS.

B ATOMS.

C IONS.

D ELECTRONS.

(33) THE POTENTIAL DIFFERENCE REQUIRED TO PASS A CURRENT 0.2 A IN A WIRE OF RESISTANCE 20 Ω IS:

A 40 V.

B 100 V.

C 1 V.

D 4 V.

(34) A WIRE OF LENGTH L AND CROSS-SECTIONAL AREA A HAS A RESISTIVITY ρ. DETERMINE WHICH OF THE FOLLOWING FORMULAS CAN BE USED TO CALCULATE THE RESISTANCE OF THE WIRE.

A $R = \frac{\rho L}{A}$.

B $R = \frac{A}{\rho L}$.

C $R = \frac{L}{\rho A}$.

D $R = \frac{\rho A}{L}$.

(35) DETERMINE THE DIRECTION OF THE CONVENTIONAL CURRENT THROUGH THE LIGHT BULB IN THE CIRCUIT PRESENTED IN FIGURE 6 AT THE END OF THE TEXT.

A TO THE RIGHT.

B UPWARD.

C TO THE LEFT.

D DOWNWARD.

36 DETERMINE WHICH ONE OF THE FOLLOWING STATEMENTS CONCERNING RESISTORS IN SERIES IS *true*.

A THE POWER DISSIPATED BY EACH RESISTOR IS THE SAME.

B THE TOTAL CURRENT THROUGH THE RESISTORS IS THE SUM OF THE CURRENT THROUGH EACH RESISTOR.

C THE CURRENT THROUGH EACH RESISTOR IS THE SAME.

D THE VOLTAGE ACROSS EACH RESISTOR IS THE SAME.

37 TWO RESISTANCES OF $100\ \Omega$ AND ZERO OHM ARE CONNECTED IN PARALLEL. THE OVERALL RESISTANCE WILL BE:

A $0\ \Omega$.

B $50\ \Omega$.

C $25\ \Omega$.

D $100\ \Omega$.

38 TWO COPPER WIRES HAVE THE SAME CROSS-SECTIONAL AREA BUT HAVE DIFFERENT LENGTHS. WIRE X HAS A LENGTH L AND WIRE Y HAS A LENGTH $2L$. THE RATIO BETWEEN THE RESISTANCE OF WIRE Y AND WIRE X IS:

A $\frac{R_Y}{R_X} = \frac{2}{1}$.

B $\frac{R_Y}{R_X} = \frac{1}{1}$.

C $\frac{R_Y}{R_X} = \frac{1}{4}$.

D $\frac{R_Y}{R_X} = \frac{1}{2}$.

39 THE ELECTRIC CURRENT AS A FUNCTION OF VOLTAGE OF A WIRE IS PRESENTED BY THE GRAPH IN FIGURE 3. COMPUTE THE RESISTANCE OF THE WIRE.

A $1.7\ \Omega$.

B $0.8\ \Omega$.

C $1\ \Omega$.

D $0.4\ \Omega$.

40 THE UNIT OF CURRENT IS:

A WATT.

B VOLT.

C COULOMB.

D AMPERE.

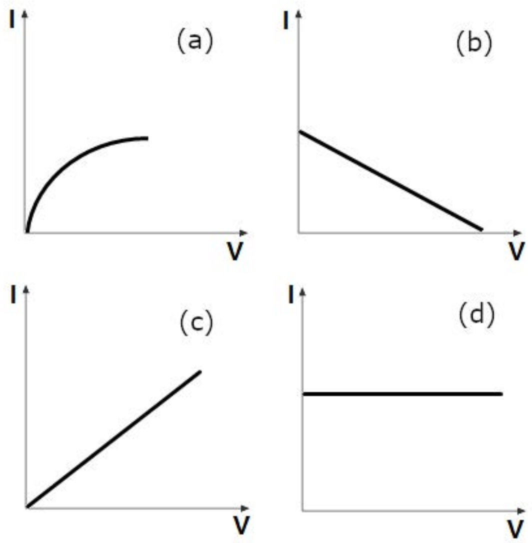

FIGURA 1

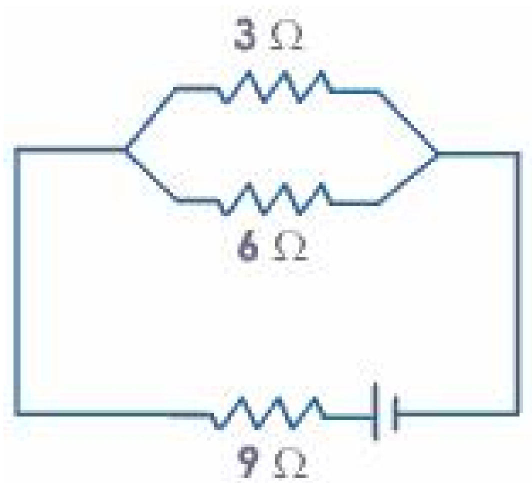

FIGURA 2

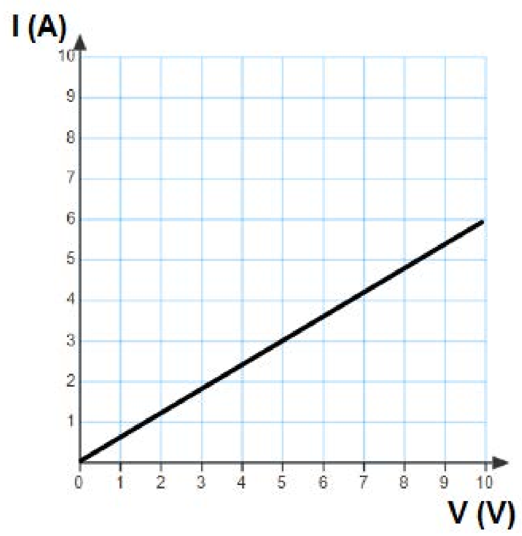

FIGURA 3

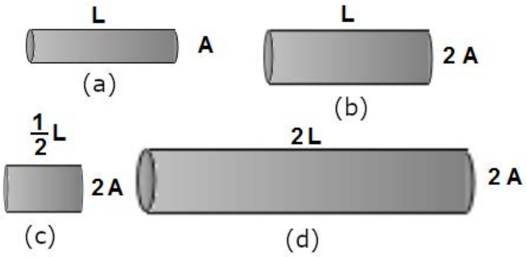

FIGURA 4

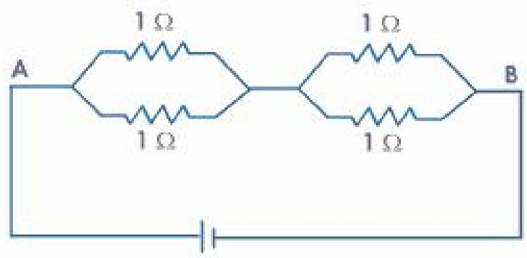

FIGURA 5

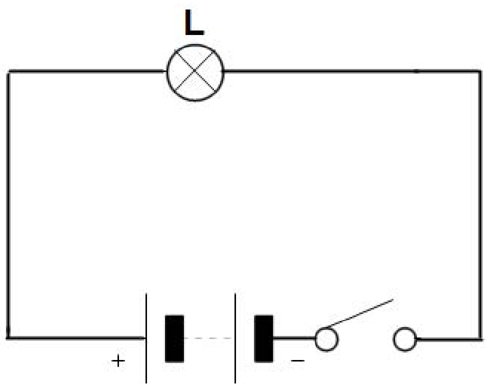

FIGURA 6