This year there were 17 credits out of 85 possible or about 20% of the test

19 What is the maximum amount of work that a 6000.-watt motor can do in 10. seconds?

(1) 6.0×10^1 J
(2) 6.0×10^2 J
(3) 6.0×10^3 J
(4) 6.0×10^4 J

20 Three resistors, 4 ohms, 6 ohms, and 8 ohms, are connected in parallel in an electric circuit. The equivalent resistance of the circuit is

(1) less than 4 Ω
(2) between 4 Ω and 8 Ω
(3) between 10. Ω and 18 Ω
(4) 18 Ω

Note that question 21 has only three choices.

21 An electric circuit contains a variable resistor connected to a source of constant voltage. As the resistance of the variable resistor is increased, the power dissipated in the circuit

(1) decreases
(2) increases
(3) remains the same

22 An electron is located in the electric field between two parallel metal plates as shown in the diagram below.

If the electron is attracted to plate A, then plate A is charged

(1) positively, and the electric field is directed from plate A toward plate B
(2) positively, and the electric field is directed from plate B toward plate A
(3) negatively, and the electric field is directed from plate A toward plate B
(4) negatively, and the electric field is directed from plate B toward plate A

23 A potential difference of 10.0 volts exists between two points, A and B, within an electric field. What is the magnitude of charge that requires 2.0×10^{-2} joule of work to move it from A to B?

(1) 5.0×10^2 C
(2) 2.0×10^{-1} C
(3) 5.0×10^{-2} C
(4) 2.0×10^{-3} C

24 A circuit consists of a resistor and a battery. Increasing the voltage of the battery while keeping the temperature of the circuit constant would result in an increase in

(1) current, only
(2) resistance, only
(3) both current and resistance
(4) neither current nor resistance

46 Charge flowing at the rate of 2.50×10^{16} elementary charges per second is equivalent to a current of

(1) 2.50×10^{13} A
(2) 6.25×10^5 A
(3) 4.00×10^{-3} A
(4) 2.50×10^{-3} A

47 An electric drill operating at 120. volts draws a current of 3.00 amperes. What is the total amount of electrical energy used by the drill during 1.00 minute of operation?

(1) 2.16×10^4 J
(2) 2.40×10^3 J
(3) 3.60×10^2 J
(4) 4.00×10^1 J

58 Two small identical metal spheres, A and B, on insulated stands, are each given a charge of $+2.0 \times 10^{-6}$ coulomb. The distance between the spheres is 2.0×10^{-1} meter. Calculate the magnitude of the electrostatic force that the charge on sphere A exerts on the charge on sphere B. [Show all work, including the equation and substitution with units.] [2]

Base your answers to questions 59 and 60 on the information and diagram below.

A 10.0-meter length of copper wire is at 20°C. The radius of the wire is 1.0×10^{-3} meter.

Cross Section of Copper Wire
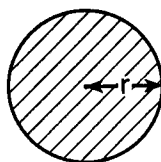
$r = 1.0 \times 10^{-3}$ m

59 Determine the cross-sectional area of the wire. [1]

60 Calculate the resistance of the wire. [Show all work, including the equation and substitution with units.] [2]

Base your answers to questions 65 through 67 on the information and diagram below.

A 15-ohm resistor, R_1, and a 30.-ohm resistor, R_2, are to be connected in parallel between points A and B in a circuit containing a 90.-volt battery.

90. V
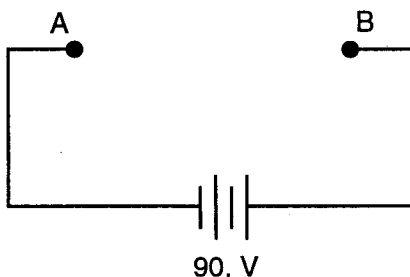
65 Complete the diagram *in your answer booklet* to show the two resistors connected in parallel between points A and B. [1]

66 Determine the potential difference across resistor R_1. [1]

67 Calculate the current in resistor R_1. [Show all work, including the equation and substitution with units.] [2]
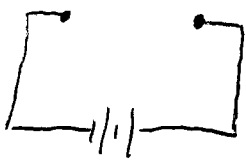
Electricity & Magnetism
Review Test June 2008

Name _____

19 _____   46 _____

20 _____   47 _____

21 _____

22 _____

23 _____

24 _____

58

59

Area = _____ m²

60

65

66

V = _____ volts

67

credits of 17	%	credits of 85	Scaled ← Regents Score
17	100.0	85	100
16	94.1	80	95
15	88.2	75	91
14	82.4	70	86
13	76.5	65	82
12	70.6	60	77
11	64.7	55	72
10	58.8	50	68
9	52.9	45	62
8	47.1	40	57
7	41.2	35	51
6	35.3	30	45
5	29.4	25	39
4	23.5	20	32
3	17.6	15	25
2	11.8	10	17

Electricity & Magnetism
Review Test June 2008

Name __Key__

19 __4__   46 __3__
20 __1__   47 __1__
21 __1__
22 __1__
23 __4__
24 __1__

58

$$F = K \frac{Q_1 Q_2}{r^2} = 9 \times 10^9 N\frac{m^2}{c^2} \frac{(2\times10^{-6}c)(2\times10^{-6}c)}{(2\times10^{-1}m)^2}$$

$$F = 9 \times 10^{-1} \text{ Newtons}$$
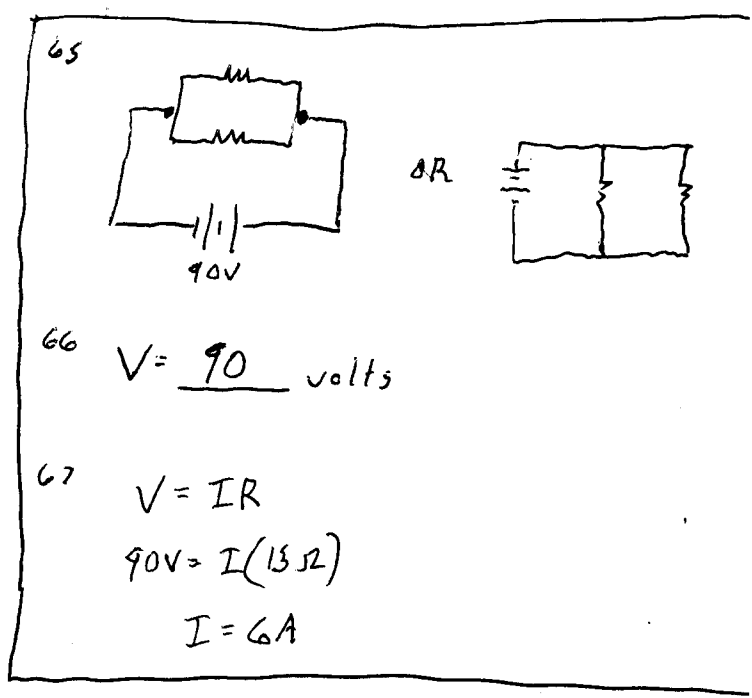
59
$$Area = 3.1 \times 10^{-6} \, m^2$$

$$A = \pi r^2$$
$$= 3.14 (1\times10^{-3} m)^2$$
$$= 3.1 \times 10^{-6} m^2$$

60
$$R = \rho \frac{\ell}{A}$$

$$= \frac{1.72 \times 10^{-8} \Omega\cdot m \, (10m)}{3.1 \times 10^{-6} m^2}$$

$$R = 5.5 \times 10^{-2} \, \Omega$$

65

90V

8R

66    $V = $ __90__ volts

67    $V = IR$
$$90V = I(15\,\Omega)$$
$$I = 6A$$

credits of 17	%	credits of 85	Scaled Regents Score
17	100.0	85	100
16	94.1	80	95
15	88.2	75	91
14	82.4	70	86
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12	70.6	60	77
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10	58.8	50	68
9	52.9	45	62
8	47.1	40	57
7	41.2	35	51
6	35.3	30	45
5	29.4	25	39
4	23.5	20	32
3	17.6	15	25
2	11.8	10	17