

Team Name: _____

Team Number: _____

Participants: _____, _____



Circuit Lab Division B Test SSSS

Score: __/97

Section 1: Multiple Choice (1 Point)

1. What is a direct circuit also known as?

- A) Farad
- B) DC
- C) Velocity
- D) Newtons

2. The voltage of batteries ranges from

- A) 5 to 10 volts
- B) 24 to 100 volts
- C) 1.4 to 24 volts
- D) 1.5 to 24 volts

3. What is current measured in?

- A) Ohms
- B) Volts
- C) Amperes
- D) Watts

4. What is a wheatstone bridge used to measure?

- A) Resistance
- B) Voltage
- C) Current
- D) Amperes

5. Who invented the first battery?

- A) Maxwell
- B) Volta
- C) Tesla
- D) Coulomb

6. If three resistors are connected in a series across a 24 volt circuit, the first resistor having a resistance of 2 ohms, the second resistor having a resistance of 3 ohms, and the third resistor having a resistance of 7 ohms, what is the current in the circuit?

- A) 150 Amps
- B) 30 Amps
- C) 2 Amps
- D) 200 Amps

7. Following question 6, what is the voltage across the 10-ohm resistor?

- A) 20 Volts

- B) 60 volts
- C) 15 volts
- D) 10 volt

8. Which is true about an alternating circuit?

- A) Has a constant direction
- B) Less hazardous
- C) Transmitted at very high voltages
- D) Used in most electronics

9. Resistance increases when there is

- A) More conductive material
- B) Shorter lengths
- C) Higher temperature
- D) Lower temperature

10. What happens when you exceed the power rating of a resistor?

- A) The resistor can be damaged
- B) It can begin to smoke
- C) The resistor can catch on fire
- D) All of the above

11. How many coils are in a single phase transformer?

- A) 1
- B) 2
- C) 3
- D) 4

12. Who discovered radio waves?

- A) Hertz
- B) Tesla
- C) Ohm
- D) Faraday

13. How do LED lights work?

- A) Positive charges collide with negative charges
- B) A wire starts to glow
- C) A gas is used to produce light

14. What is a capacitor used for?

- A) To measure power

- B) Reverses direction in an AC circuit
- C) Holds and releases a charge
- D) Transmits charges

15. Positive to negative is known as a
- A) An electron flow
 - B) Direct current
 - C) Alternating current
 - D) Conventional flow

16. A negative to positive flow is known as a
- A) Electron flow
 - B) Conventional flow
 - C) Direct current
 - D) Alternating current

17. Voltage is the force behind
- A) Electrons
 - B) Neutrons
 - C) Protons

18. The wider a wire is, the resistance
- A) Increases
 - B) Decreases
 - C) Stays the same

19. The current entering any junction is
- A) Less than the current leaving that junction
 - B) More than the current leaving that junction
 - C) Equal to the current leaving that junction
 - D) Double the current leaving that junction

20. Poles will always find
- A) The longest path
 - B) The shortest path
 - C) Equivalent paths
 - D) None of the above

21. Fleming's Right Hand rule can be applied to
- A) Electric motors
 - B) Resistance

- C) Current
- D) Electric generators

22. What are the two types of transformers?

- A) AC and DC
- B) Volt and Ohm
- C) Amperes and Volts
- D) Step up and step down

23. Who proved that electric current has negligible mass?

- A) Volta
- B) Kirchhoff
- C) Ampère
- D) Hertz

24. What is a magnetic monopole?

- A) Magnets with 1 pole
- B) Magnets with 2 poles
- C) Magnets with 3 poles
- D) Magnets with 4 poles

25. What happens when you exceed the max current of an LED?

- A) It becomes brighter
- B) The LED begins to burn
- C) It will remain the same
- D) The LED will produce less light

Section Two: True or False (1 Point)

26. DC is more dangerous than AC.

- A) True
- B) False

27. Magnetic poles always flow from North to South.

- A) True
- B) False

28. Motors can be used as generators in reverse.

- A) True
- B) False

29. A standard diode allows current one way.
A) True
B) False
30. There is a single coil in a single-phase transformer.
A) True
B) False
31. Hertz discovered laws connected to the strength of a current in a wire.
A) True
B) False
32. Ohm's law describes the electrostatic force of attraction and repulsion.
A) True
B) False
33. Every circuit includes wire and a power source
A) True
B) False
34. Home electricity ranges from 60 volts to 70 volts.
A) True
B) False
35. In Kirchoff's Voltage Law, the sum of all voltages must equal to 5.
A) True
B) False
36. Electric field lines have a definite starting and end point.
A) True
B) False
37. Paramagnets magnetize readily.
A) True
B) False
38. Transformers only work with DC.
A) True
B) False
39. The longer side in an LED is called cathode
A) True
B) False

40. A motor has an electromagnet repel against another.

- A) True
- B) False

41. The laptop that has every part runs on AC

- A) True
- B) False

Section Three: Calculations (5 Points)

42. How many amps of current does a 200-watt, 100-volt lightbulb require?

43. What is the resistance of a parallel circuit that includes four 1000-ohm resistors?

44. How much current does a 250-watt charger draw if supplied with a 25-volt source?

45. 20 joules of energy are required to move 10 coulombs between two points. What is the potential difference between the two points equal to?

46. If a 20-farad capacitor is used in a circuit, and the voltage difference between the plates is 5 volts, what is the magnitude of the charge on each of the capacitor's plates?

Section Four: Matching (2 Points)

Directions: Match each word in the word bank with the correct description

Coulomb's Law	Faraday's Law of induction	Ohm's Law
Gauss's Law of Magnetism	Ampere's Force Law	

47. The force of attraction or repulsion between two current-carrying wires.

48. Predicting how a magnetic field will interact with an electric circuit to produce an electromotive force.

49. The description of the electrostatic force of attraction and repulsion.

50. One of the four Maxwell's equations that underlie classical electrodynamics.

51. A basic equation used when analyzing electrical circuits.

Section Five: Short Answer (3 Points)

52. What are the BIG THREE in the field of electricity?

53. What is the formula to calculate voltage or the Ohm's law?

54. What is the difference between DC and AC

55. What are breakers and fuses used for?

56. Name some of the top common conductors

57. Name some of the top common insulators

58. Why do line workers wear rubber gloves?