



# PANIMALAR ENGINEERING COLLEGE

An Autonomous Institution

[JAISAKTHI EDUCATIONAL TRUST]

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All Eligible UG Programs are Accredited by NBA

Bangalore Trunk Road, Varadharajapuram, Poonamallee, Chennai- 600 123

## Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

### **SYLLABUS: UNIT I - BASIC ELECTRICAL CIRCUITS AND HOUSE WIRING**

Electrical Quantities – Ohms Law – Kirchhoff's Law – Series and Parallel Connections –Earthing and its Types- basic house wiring - tools and components, different types of wiring, safety measures at home and industry. Case Study -staircase Wiring and ceiling fan Wiring.

**CO1:** Acquire basic knowledge on Basic Electrical circuits and House Wiring

### **23ES1102- UNIT I – MCQ – SET A**

Year/Semester : I/II

Max Time : 30 Mins

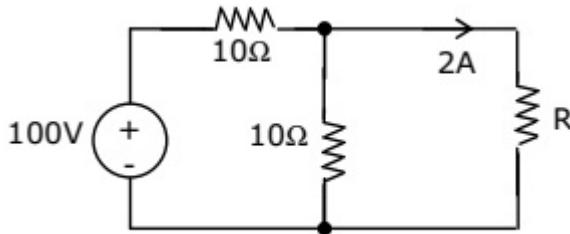
Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
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| 1.    | A 10 $\Omega$ resistor is connected to a 12 V battery. Calculate the current through the resistor.<br>A) 0.8 A<br>B) 1.2 A<br>C) 1.0 A<br>D) 1.5 A<br><b>Answer: B) 1.2 A</b>  | CO1  |
| 2.    | Two resistors, 4 $\Omega$ and 6 $\Omega$ , are connected in parallel. What is the equivalent resistance?<br>A) 2.4 $\Omega$<br>B) 10 $\Omega$<br>C) 5 $\Omega$<br>D) 6 $\Omega$<br><b>Answer: A) 2.4 <math>\Omega</math></b> | CO1  |
| 3.    | A current of 5 A flows through a 15 $\Omega$ resistor. Determine the power dissipated.<br>A) 50 W<br>B) 75 W<br>C) 225 W<br>D) 375 W<br><b>Answer: D) 375 W</b>  | CO1  |
| 4.    | In a series circuit with a 12 V battery, two resistors of 4 $\Omega$ and 6 $\Omega$ are connected. Calculate the current.<br>A) 1.2 A<br>B) 0.8 A<br>C) 2.0 A<br>D) 1.0 A<br><b>Answer: B) 0.8 A</b>                         | CO1  |

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| 5.  | <p>In the circuit, three loops are connected with voltage sources of 10 V, 20 V, and 5 V. Using Kirchhoff's Voltage Law (KVL), determine the loop currents.</p> <p>A) 2 A, 3 A, 1 A<br/>B) 1 A, 2 A, 3 A<br/>C) Depends on the resistances<br/>D) None of the above</p> <p><b>Answer:</b> C) Depends on the resistances</p>  | CO1 |
| 6.  | <p><b>The following resistors (one each) are connected in a series circuit: 470 Ω, 680 Ω, 1 kΩ, and 1.2 kΩ. The voltage source is 20 V. Current through the 680 Ω resistor is approximately</b></p> <p>a) 6A<br/>b) 6nA<br/>c) 6mA<br/>d) 6μA</p> <p><b>Answer:</b> c) 6mA</p>   | CO1 |
| 7.  | <p>Four resistors, 2 Ω, 4 Ω, 6 Ω, and 8 Ω, are connected in series. What is the total resistance?</p> <p>A) 20 Ω<br/>B) 15 Ω<br/>C) 25 Ω<br/>D) 10 Ω</p> <p><b>Answer:</b> C) 20 Ω</p>   | CO1 |
| 8.  | <p>Determine the total resistance for the same resistors if connected in parallel.</p> <p>A) 1.09 Ω<br/>B) 2.5 Ω<br/>C) 4 Ω<br/>D) 10 Ω</p> <p><b>Answer:</b> A) 1.09 Ω</p>  | CO1 |
| 9.  | <p><b>Which of the following statements is true for a parallel circuit?</b></p> <p>A) The total resistance is the sum of individual resistances.<br/>B) The total current is the sum of individual currents.<br/>C) The voltage across each resistor is different.<br/>D) The current through each resistor is the same.</p> <p><b>Answer:</b> B) The total current is the sum of individual currents.</p> | CO1 |
| 10. | <p>Identify the type of earthing where the earthing plate is buried deep into the ground.</p> <p>A) Rod earthing<br/>B) Plate earthing<br/>C) Strip earthing<br/>D) None of the above</p> <p><b>Answer:</b> B) Plate earthing</p>  | CO1 |

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| 11. | <p><b>Relation between currents according to KCL is</b></p> <p>a) <math>i_1 = i_2 = i_3 = i_4 = i_5</math><br/> b) <math>i_1 + i_4 + i_3 = i_5 + i_2</math><br/> c) <math>i_1 - i_5 = i_2 - i_3 - i_4</math><br/> d) <math>i_1 + i_5 = i_2 + i_3 + i_4</math></p> <p><b>Answer: d) <math>i_1 + i_5 = i_2 + i_3 + i_4</math></b></p> | CO1 |
| 12. | <p><b>Electrical appliances are not connected in series because</b></p> <p>a) Series circuit is complicated<br/> b) Power loss is more<br/> c) Appliances have different current ratings<br/> d) None of the above.</p> <p><b>Answer: c) Appliances have different current ratings.</b></p>   | CO1 |
| 13. | <p>Which tool is used to test the continuity of electrical wiring?</p> <p>A) Multimeter<br/> B) Megger<br/> C) Screwdriver<br/> D) Hammer</p> <p><b>Answer: A) Multimeter</b></p>   | CO1 |
| 14. | <p><b>An external resistance R is connected to a cell of internal resistance r. The maximum current flows in the external resistance when</b></p> <p>a) <math>R &lt; r</math><br/> b) <math>R &gt; r</math><br/> c) <math>R = r</math>.<br/> d) any other value of R.</p> <p><b>Answer: c) <math>R = r</math>.</b></p>              | CO1 |
| 15. | <p>Judge the safety level of a house with no RCCB installed.</p> <p>A) Safe<br/> B) Risky<br/> C) Normal<br/> D) High-risk</p> <p><b>Answer: D) High-risk</b></p>   | CO1 |
| 16. | <p>In staircase wiring, how many switches control a single lamp?</p> <p>A) One<br/> B) Two<br/> C) Three<br/> D) Four</p> <p><b>Answer: B) Two</b></p>  | CO1 |
| 17. | <p><b>For the circuit shown, the value of R is</b></p>  | CO1 |



- a) 10  $\Omega$
- b) 20  $\Omega$
- c) 30  $\Omega$
- d) 40  $\Omega$

**Answer: d) 20  $\Omega$**

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| 18. | <p><b>A ceiling fan operates at 220 V and consumes 100 W. Calculate the current drawn by the fan.</b></p> <p>A) 0.45 A<br/>B) 0.6 A<br/>C) 0.9 A<br/>D) 1.0 A</p> <p><b>Answer: B) 0.6 A</b></p>  | CO1 |
| 19. | <p><b>Evaluate the use of copper over aluminum in house wiring.</b></p> <p>A) Copper has higher conductivity.<br/>B) Copper is less expensive.<br/>C) Aluminum is safer.<br/>D) Aluminum is more durable.</p> <p><b>Answer: A) Copper has higher conductivity.</b></p>  | CO1 |
| 20. | <p><b>In a series circuit with resistances of <math>4 \Omega</math>, <math>5 \Omega</math>, and <math>6 \Omega</math> connected to a 15 V battery, calculate the total current.</b></p> <p>A) 0.5 A<br/>B) 1.0 A<br/>C) 2.0 A<br/>D) 1.5 A</p> <p><b>Answer: A) 0.5 A</b></p>                                   | CO1 |
| 21. | <p><b>Which type of earthing involves embedding a metal plate into the ground?</b></p> <p>A) Rod earthing<br/>B) Plate earthing<br/>C) Strip earthing<br/>D) Chemical earthing</p> <p><b>Answer: B) Plate earthing</b></p>  | CO1 |
| 22. | <p><b>Analyze the impact of using an RCCB in a household wiring system.</b></p> <p>A) Improves safety by detecting current imbalances.<br/>B) Increases power consumption.<br/>C) Reduces wiring costs.<br/>D) None of the above.</p> <p><b>Answer: A) Improves safety by detecting current imbalances.</b></p> | CO1 |
| 23. | <p><b>A 12 V battery is connected across a resistor network with equivalent resistance of <math>8 \Omega</math>. Calculate the power delivered by the battery.</b></p> <p>A) 12 W<br/>B) 18 W<br/>C) 24 W</p>   | CO1 |

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|     | D) 36 W<br><b>Answer: C) 24 W</b>   |     |
| 24. | <b>Which tool is primarily used to measure the resistance of an earthing system?</b><br>A) Multimeter<br>B) Megger<br>C) Voltmeter<br>D) Ammeter<br><b>Answer: B) Megger</b>  | CO1 |
| 25. | <b>Two resistors, <math>10\ \Omega</math> and <math>20\ \Omega</math>, are connected in series to a 12 V battery. Calculate the voltage drop across the <math>10\ \Omega</math> resistor.</b><br>A) 4 V<br>B) 6 V<br>C) 8 V<br>D) 12 V<br><b>Answer: B) 4 V</b>   | CO1 |
| 26. | <b>The purpose of earthing is to:</b><br>a) Increase voltage<br>b) Reduce voltage<br>c) Provide a low-resistance path for fault currents<br>d) Prevent short circuits<br><b>Answer: c) Provide a low-resistance path for fault currents</b>   | CO1 |
| 27. | <b>A house has a 60 W bulb and a 100 W bulb connected in parallel to a 220 V supply. Calculate the total current drawn.</b><br>A) 0.5 A<br>B) 0.75 A<br>C) 0.8 A<br>D) 1.0 A<br><b>Answer: B) 0.75 A</b>  | CO1 |
| 28. | <b>In a mixed circuit, a <math>10\ \Omega</math> resistor is connected in parallel with a <math>20\ \Omega</math> resistor, and the combination is in series with a <math>5\ \Omega</math> resistor. Find the equivalent resistance.</b><br>A) $10\ \Omega$<br>B) $12\ \Omega$<br>C) $15\ \Omega$<br>D) $20\ \Omega$<br><b>Answer: B) <math>12\ \Omega</math></b> | CO1 |
| 29. | <b>Which type of wiring is preferred for industrial applications due to its durability and safety?</b><br>A) Cleat wiring<br>B) Conduit wiring<br>C) Batten wiring<br>D) Casing and capping wiring<br><b>Answer: B) Conduit wiring</b>  | CO1 |
| 30. | <b>A 100 W LED operates for 5 hours a day. Calculate the total energy consumption over 30 days.</b><br>A) 15 kWh<br>B) 12 kWh<br>C) 10 kWh<br>D) 5 kWh<br><b>Answer: A) 15 kWh</b>  | CO1 |

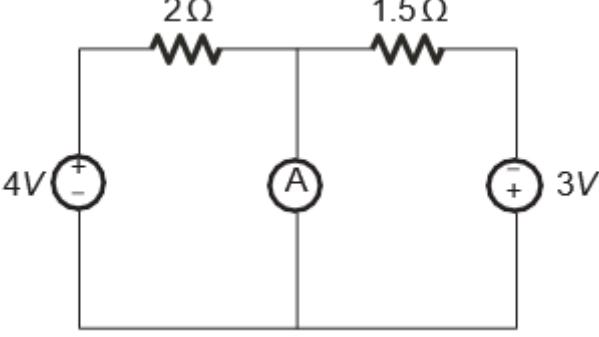
## Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

### **23ES1102- UNIT I – MCQ – SET B**

|                      |                    |
|----------------------|--------------------|
| Year/Semester : I/II | Max Time : 30 Mins |
| Regulation : 2023    | Max Marks : 30     |

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | <p>A 12 V battery is connected to a resistor. The current flowing through the resistor is 4 A. Calculate the resistance.</p> <p>A) 2 <math>\Omega</math><br/>           B) 3 <math>\Omega</math><br/>           C) 4 <math>\Omega</math><br/>           D) 6 <math>\Omega</math></p> <p>Answer: B) 3 <math>\Omega</math></p>                                       | CO1  |
| 2.    | <p>Two resistors of 6 <math>\Omega</math> and 12 <math>\Omega</math> are connected in parallel. What is the equivalent resistance?</p> <p>A) 18 <math>\Omega</math><br/>           B) 4 <math>\Omega</math><br/>           C) 6 <math>\Omega</math><br/>           D) 8 <math>\Omega</math></p> <p>Answer: D) 4 <math>\Omega</math></p>                            | CO1  |
| 3.    | <p>A 50 W bulb operates on a 100 V supply. Calculate the current drawn by the bulb.</p> <p>A) 0.5 A<br/>           B) 1.0 A<br/>           C) 2.0 A<br/>           D) 1.5 A</p> <p>Answer: A) 0.5 A</p>  | CO1  |
| 4.    | <p>In a circuit, the sum of currents at a node is 10 A. If two branches carry 4 A and 3 A, find the current in the third branch.</p> <p>A) 3 A<br/>           B) 4 A<br/>           C) 6 A<br/>           D) 7 A</p> <p>Answer: A) 3 A</p>   | CO1  |
| 5.    | <p>A resistor of 10 <math>\Omega</math> and a capacitor are connected in series across a 12 V AC supply. If the current is 2 A, find the capacitive reactance.</p> <p>A) 4 <math>\Omega</math><br/>           B) 5 <math>\Omega</math><br/>           C) 6 <math>\Omega</math><br/>           D) 8 <math>\Omega</math></p> <p>Answer: B) 5 <math>\Omega</math></p> | CO1  |
| 6.    | <p>In a staircase wiring system, two switches are connected to control a single bulb. What is the state of the bulb if one switch is ON and the other is OFF?</p> <p>A) ON</p>   | CO1  |

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|     | B) OFF<br>C) Flickering<br>D) None of the above<br><br>Answer: A) ON   |     |
| 7.  | A certain current source has the values $I_s = 4 \mu\text{A}$ and $R_s = 1.2 \text{ M } \Omega$ . The values for an equivalent voltage source are<br><br>A) $4.8 \mu\text{V}, 1.2 \text{ M } \Omega$<br>B) $1 \text{ V}, 1.2 \text{ M } \Omega$<br>C) $4.8 \text{ V}, 4.8 \text{ M } \Omega$<br>D) $4.8 \text{ V}, 1.2 \text{ M } \Omega$<br><br>Answer: D) $4.8 \text{ V}, 1.2 \text{ M } \Omega$ | CO1 |
| 8.  | In a series circuit with resistances of $4 \Omega$ , $5 \Omega$ , and $6 \Omega$ connected to a $15 \text{ V}$ battery, calculate the total current.<br><br>A) $0.5 \text{ A}$<br>B) $1.0 \text{ A}$<br>C) $2.0 \text{ A}$<br>D) $1.5 \text{ A}$<br><br>Answer: A) $0.5 \text{ A}$   | CO1 |
| 9.  | Which type of earthing involves embedding a metal plate into the ground?<br><br>A) Rod earthing<br>B) Plate earthing<br>C) Strip earthing<br>D) Chemical earthing<br><br>Answer: B) Plate earthing   | CO1 |
| 10. | The current through the ideal ammeter in the circuit shown is<br><br><br><br>A) 1<br>B) 1.5<br>C) 2<br>D) 4<br><br>Answer: D) 4   | CO1 |
| 11. | A $100 \text{ V}$ power supply is connected to two resistors of $10 \Omega$ and $20 \Omega$ in parallel. What is the total current supplied to the circuit?<br><br>A) $15 \text{ A}$<br>B) $10 \text{ A}$<br>C) $5 \text{ A}$<br>D) $3 \text{ A}$<br><br>Answer: C) $5 \text{ A}$  | CO1 |
| 12. | What is the total resistance in a parallel circuit with resistors of $10 \Omega$ , $20 \Omega$ , and $30 \Omega$ ?   | CO1 |

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|     | A) $5.45 \Omega$<br>B) $10 \Omega$<br>C) $8 \Omega$<br>D) $15 \Omega$<br><br>Answer: A) $5.45 \Omega$  |     |
| 13. | Which of the following wiring systems is best suited for outdoor installations?<br>A) Conduit wiring<br>B) Batten wiring<br>C) Cleat wiring<br>D) Surface wiring<br><br>Answer: A) Conduit wiring  | CO1 |
| 14. | Which type of earthing is used to protect equipment from electrical faults?<br>A) System earthing<br>B) Equipment earthing<br>C) Earth leakage<br>D) Neutral earthing<br><br>Answer: B) Equipment earthing   | CO1 |
| 15. | Two capacitors, $6 \mu\text{F}$ and $12 \mu\text{F}$ , are connected in series. Calculate the equivalent capacitance.<br>A) $18 \mu\text{F}$<br>B) $4 \mu\text{F}$<br>C) $8 \mu\text{F}$<br>D) $3 \mu\text{F}$<br><br>Answer: B) $4 \mu\text{F}$   | CO1 |
| 16. | Determine the current through a 40 W bulb operating at 220 V.<br>A) 0.18 A<br>B) 0.22 A<br>C) 0.25 A<br>D) 0.36 A<br><br>Answer: A) 0.18 A   | CO1 |
| 17. | In a mixed circuit with $5 \Omega$ , $10 \Omega$ , and $20 \Omega$ resistors, how would you configure them to achieve the lowest total resistance?<br>A) All in series<br>B) All in parallel<br>C) $5 \Omega$ and $10 \Omega$ in series, parallel with $20 \Omega$<br>D) $10 \Omega$ and $20 \Omega$ in parallel, series with $5 \Omega$<br><br>Answer: B) All in parallel | CO1 |
| 18. | Which of the following devices is used to detect electric faults in an electrical system?<br>A) Ammeter<br>B) Multimeter<br>C) RCD (Residual Current Device)<br>D) Voltmeter<br><br>Answer: C) RCD (Residual Current Device)   | CO1 |
| 19. | Which of the following is a disadvantage of a series circuit?<br>A) Uneven current distribution<br>B) One component failure affects the entire circuit<br>C) Reduced resistance<br>D) Increased current flow<br><br>Answer: B) One component failure affects the entire circuit  | CO1 |

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| 20. | <p>In a three-phase circuit, the total power consumed by the load is 6 kW. If the line voltage is 400 V, calculate the current per phase.</p> <p>A) 8.66 A<br/>B) 10 A<br/>C) 12 A<br/>D) 15 A</p> <p>Answer: A) 8.66 A</p>  | CO1 |
| 21. | <p>A battery of 12 V is connected to a resistor of <math>4\ \Omega</math>. What is the power delivered by the battery?</p> <p>A) 3 W<br/>B) 6 W<br/>C) 9 W<br/>D) 12 W</p> <p>Answer: B) 6 W</p>   | CO1 |
| 22. | <p>What is the effect of connecting resistors in parallel?</p> <p>A) Increases total resistance<br/>B) Decreases total resistance<br/>C) Does not change total resistance<br/>D) Increases current</p> <p>Answer: B) Decreases total resistance</p>  | CO1 |
| 23. | <p>What is the primary function of earthing in an electrical circuit?</p> <p>A) To increase power supply<br/>B) To provide a path for excess current to flow safely to the ground<br/>C) To decrease the voltage<br/>D) To regulate current flow</p> <p>Answer: B) To provide a path for excess current to flow safely to the ground</p> | CO1 |
| 24. | <p>In a power transmission system, what is the purpose of using high voltage for transmission?</p> <p>A) To reduce energy loss<br/>B) To increase current flow<br/>C) To improve insulation<br/>D) To reduce power factor</p> <p>Answer: A) To reduce energy loss</p>  | CO1 |
| 25. | <p>Which wire is typically used for the live connection in house wiring?</p> <p>A) Red<br/>B) Black<br/>C) Blue<br/>D) Green</p> <p>Answer: A) Red</p>   | CO1 |
| 26. | <p>For the circuit shown, the value of R is</p> <p>a) <math>10\ \Omega</math></p>  | CO1 |

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|     | b) 20 $\Omega$<br>c) 30 $\Omega$<br>d) 40 $\Omega$<br><br>Answer: d) 20 $\Omega$  |     |
| 27. | Which of the following is the correct unit of electrical charge?<br>A) Ampere<br>B) Coulomb<br>C) Volt<br>D) Watt<br><br>Answer: B) Coulomb   | CO1 |
| 28. | What is the purpose of earthing in electrical systems?<br>A) To increase the voltage<br>B) To provide a path for fault current<br>C) To reduce the current<br>D) To insulate the system<br><br>Answer: B) To provide a path for fault current | CO1 |
| 29. | If there are 5 nodes then the no of nodal equations are<br>a) 5<br>b) 0<br>c) 1<br>d) 4<br><br>Answer: 4  | CO1 |
| 30. | Relation between power, voltage and conductance<br>a) $V = P^2 \cdot G$<br>b) $V = P^2/G$<br>c) $P = v^2/G$<br>d) $P = V^2 G$<br><br>Answer: $P = V^2 G$  | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**  
**23ES1102- UNIT I – MCQ – SET C**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | <p>A wire carries a current of 5 A for 10 seconds. How much charge passes through the wire?</p> <p>A) 50 C<br/>         B) 10 C<br/>         C) 5 C<br/>         D) 25 C</p> <p>Answer: A) 50 C</p>  | CO1  |
| 2.    | <p>A resistor of <math>5 \Omega</math> and another of <math>10 \Omega</math> are connected in parallel. What is the equivalent resistance?</p> <p>A) <math>3.33 \Omega</math><br/>         B) <math>5 \Omega</math><br/>         C) <math>6.67 \Omega</math><br/>         D) <math>7.5 \Omega</math></p> <p>Answer: A) <math>3.33 \Omega</math></p>    | CO1  |
| 3.    | <p>If a 12 V battery supplies 2 A to a circuit, calculate the power delivered by the battery.</p> <p>A) 12 W<br/>         B) 24 W<br/>         C) 6 W<br/>         D) 48 W</p> <p>Answer: B) 24 W</p>  | CO1  |
| 4.    | <p>In a series circuit with three resistors (<math>5 \Omega</math>, <math>10 \Omega</math>, <math>15 \Omega</math>), what is the total resistance?</p> <p>A) <math>30 \Omega</math><br/>         B) <math>15 \Omega</math><br/>         C) <math>10 \Omega</math><br/>         D) <math>35 \Omega</math></p> <p>Answer: A) <math>30 \Omega</math></p>  | CO1  |
| 5.    | <p>In a parallel circuit, one branch has 3 A and the other has 4 A. What is the total current entering the circuit?</p> <p>A) 5 A<br/>         B) 6 A<br/>         C) 7 A<br/>         D) 12 A</p> <p>Answer: C) 7 A</p>   | CO1  |
| 6.    | <p>A circuit has three resistors in parallel: <math>6 \Omega</math>, <math>12 \Omega</math>, and <math>18 \Omega</math>. Find the equivalent resistance.</p> <p>A) <math>2 \Omega</math><br/>         B) <math>4 \Omega</math><br/>         C) <math>3 \Omega</math><br/>         D) <math>6 \Omega</math></p> <p>Answer: B) <math>4 \Omega</math></p> | CO1  |

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| 7.  | A house wiring system includes a 100 W bulb and a 60 W bulb connected in parallel to a 240 V supply. Calculate the current drawn by the 100 W bulb.<br>A) 0.42 A<br>B) 0.5 A<br>C) 0.6 A<br>D) 1 A<br><br>Answer: B) 0.5 A                                    | CO1 |
| 8.  | Two capacitors, 6 $\mu\text{F}$ and 12 $\mu\text{F}$ , are connected in series. Calculate the equivalent capacitance.<br>A) 18 $\mu\text{F}$<br>B) 4 $\mu\text{F}$<br>C) 8 $\mu\text{F}$<br>D) 3 $\mu\text{F}$<br><br>Answer: B) 4 $\mu\text{F}$              | CO1 |
| 9.  | Determine the current through a 40 W bulb operating at 220 V.<br>A) 0.18 A<br>B) 0.22 A<br>C) 0.25 A<br>D) 0.36 A<br><br>Answer: A) 0.18 A  | CO1 |
| 10. | Which type of wiring is best suited for a multi-story building?<br>A) Cleat wiring<br>B) Conduit wiring<br>C) Batten wiring<br>D) Surface wiring<br><br>Answer: B) Conduit wiring   | CO1 |
| 11. | What is the purpose of an RCCB in electrical systems?<br>A) Measures voltage<br>B) Protects from overcurrent<br>C) Detects leakage currents and prevents shocks<br>D) Provides high resistance<br><br>Answer: C) Detects leakage currents and prevents shocks | CO1 |
| 12. | In a three-phase system, how is neutral earthing beneficial?<br>A) Balances the load<br>B) Reduces voltage<br>C) Prevents electric shocks<br>D) Reduces short-circuits<br><br>Answer: C) Prevents electric shocks   | CO1 |
| 13. | A $12 \Omega$ resistor dissipates 36 W of power. What is the current through the resistor?<br>A) 2 A<br>B) 3 A<br>C) 4 A<br>D) 6 A<br><br>Answer: A) 2 A  | CO1 |
| 14. | A $10 \Omega$ and a $20 \Omega$ resistor are connected in series across a 30 V supply. Calculate the voltage drop across the $20 \Omega$ resistor.<br>A) 10 V<br>B) 20 V<br>C) 15 V<br>D) 5 V<br><br>Answer: B) 20 V  | CO1 |

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| 15. | In staircase wiring, how many two-way switches are required to control one light?<br>A) 1<br>B) 2<br>C) 3<br>D) 4<br><br>Answer: B) 2  | CO1 |
| 16. | What is the unit of electrical conductivity?<br>A) Ohm<br>B) Siemens<br>C) Farad<br>D) Coulomb<br><br>Answer: B) Siemens   | CO1 |
| 17. | Which type of earthing is best for rocky soil?<br>A) Plate earthing<br>B) Rod earthing<br>C) Strip earthing<br>D) Chemical earthing<br><br>Answer: B) Rod earthing   | CO1 |
| 18. | A 220 V supply powers a device with a resistance of $44 \Omega$ . Calculate the current.<br>A) 5 A<br>B) 10 A<br>C) 15 A<br>D) 20 A<br><br>Answer: A) 5 A  | CO1 |
| 19. | Two resistors of $8 \Omega$ and $16 \Omega$ are connected in parallel and then in series with a $10 \Omega$ resistor. Find the total resistance.<br>A) $10 \Omega$<br>B) $15 \Omega$<br>C) $18 \Omega$<br>D) $20 \Omega$<br><br>Answer: B) $15 \Omega$ | CO1 |
| 20. | What safety device is used to protect an electrical system from overloading?<br>A) RCCB<br>B) Fuse<br>C) Relay<br>D) Transformer<br><br>Answer: B) Fuse  | CO1 |
| 21. | A wire's resistance is $10 \Omega$ , and it carries a current of 2 A. Calculate the heat generated in 5 seconds.<br>A) 100 J<br>B) 200 J<br>C) 400 J<br>D) 500 J<br><br>Answer: C) 400 J   | CO1 |
| 22. | In a household, which type of wiring ensures long durability and safety?<br>A) Batten wiring<br>B) Cleat wiring<br>C) Conduit wiring<br>D) Surface wiring<br><br>Answer: C) Conduit wiring   | CO1 |

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| 23. | In a circuit, a $10\ \Omega$ resistor is connected in series with a $5\ \Omega$ resistor. If the total voltage is 30 V, calculate the current in the circuit.<br>A) 2 A<br>B) 3 A<br>C) 4 A<br>D) 5 A<br><br>Answer: A) 2 A   | CO1 |
| 24. | What is the main reason for using earthing in electrical systems?<br>A) To improve power factor<br>B) To prevent electric shocks<br>C) To reduce current flow<br>D) To increase resistance<br><br>Answer: B) To prevent electric shocks   | CO1 |
| 25. | A fan draws 2 A current from a 220 V supply. Calculate the power consumed.<br>A) 110 W<br>B) 220 W<br>C) 440 W<br>D) 880 W<br><br>Answer: C) 440 W  | CO1 |
| 26. | Which tool is commonly used to test the insulation of house wiring?<br>A) Megger<br>B) Multimeter<br>C) Voltmeter<br>D) Ammeter<br><br>Answer: A) Megger  | CO1 |
| 27. | A device operates at 100 W on a 240 V supply. Calculate its resistance.<br>A) $576\ \Omega$<br>B) $600\ \Omega$<br>C) $480\ \Omega$<br>D) $560\ \Omega$<br><br>Answer: A) $576\ \Omega$   | CO1 |
| 28. | In a mixed circuit with $5\ \Omega$ , $10\ \Omega$ , and $20\ \Omega$ resistors, how would you configure them to achieve the lowest total resistance?<br>A) All in series<br>B) All in parallel<br>C) $5\ \Omega$ and $10\ \Omega$ in series, parallel with $20\ \Omega$<br>D) $10\ \Omega$ and $20\ \Omega$ in parallel, series with $5\ \Omega$<br><br>Answer: B) All in parallel | CO1 |
| 29. | A 100 W bulb operates on a 220 V supply. Calculate the resistance of the bulb.<br>A) $484\ \Omega$<br>B) $500\ \Omega$<br>C) $440\ \Omega$<br>D) $600\ \Omega$<br><br>Answer: A) $484\ \Omega$  | CO1 |
| 30. | A ceiling fan draws 1.5 A from a 230 V supply. Calculate its power consumption.<br>A) 345 W<br>B) 300 W<br>C) 230 W<br>D) 400 W<br><br>Answer: A) 345 W   | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – MCQ – SET D**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS   | CO'S |
|-------|---|------|
| 1.    | <p>What is the total resistance in a circuit containing a <math>4 \Omega</math>, <math>6 \Omega</math>, and <math>8 \Omega</math> resistor connected in series?</p> <p>A) <math>18 \Omega</math><br/>         B) <math>12 \Omega</math><br/>         C) <math>8 \Omega</math><br/>         D) <math>6 \Omega</math></p> <p>Answer: B) <math>12 \Omega</math></p>                | CO1  |
| 2.    | <p>A current of <math>5 \text{ A}</math> flows through a conductor of resistance <math>2 \Omega</math>. What is the voltage across the conductor?</p> <p>A) <math>10 \text{ V}</math><br/>         B) <math>5 \text{ V}</math><br/>         C) <math>2 \text{ V}</math><br/>         D) <math>15 \text{ V}</math></p> <p>Answer: A) <math>10 \text{ V}</math></p>               | CO1  |
| 3.    | <p>A resistor of <math>20 \Omega</math> is connected in parallel with another resistor of <math>10 \Omega</math>. Find the total resistance.</p> <p>A) <math>6.67 \Omega</math><br/>         B) <math>30 \Omega</math><br/>         C) <math>15 \Omega</math><br/>         D) <math>8 \Omega</math></p> <p>Answer: A) <math>6.67 \Omega</math></p>                              | CO1  |
| 4.    | <p>What is the power dissipated by a resistor of <math>10 \Omega</math> when a current of <math>3 \text{ A}</math> flows through it?</p> <p>A) <math>30 \text{ W}</math><br/>         B) <math>90 \text{ W}</math><br/>         C) <math>45 \text{ W}</math><br/>         D) <math>60 \text{ W}</math></p> <p>Answer: B) <math>90 \text{ W}</math></p>                          | CO1  |
| 5.    | <p>The resistance of a wire is <math>5 \Omega</math> and the current passing through it is <math>2 \text{ A}</math>. What is the power dissipated in the wire?</p> <p>A) <math>5 \text{ W}</math><br/>         B) <math>10 \text{ W}</math><br/>         C) <math>20 \text{ W}</math><br/>         D) <math>40 \text{ W}</math></p> <p>Answer: B) <math>10 \text{ W}</math></p> | CO1  |
| 6.    | <p>How much energy is consumed by a <math>500 \text{ W}</math> electric bulb in <math>2 \text{ hours}</math>?</p> <p>A) <math>1000 \text{ J}</math><br/>         B) <math>10000 \text{ J}</math><br/>         C) <math>3600 \text{ J}</math><br/>         D) <math>3600000 \text{ J}</math></p> <p>Answer: B) <math>10000 \text{ J}</math></p>                                  | CO1  |
| 7.    | <p>In a parallel circuit, what is the equivalent resistance of two resistors, <math>4 \Omega</math> and <math>6 \Omega</math>?</p>  | CO1  |

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|     | A) $10 \Omega$<br>B) $2.4 \Omega$<br>C) $5 \Omega$<br>D) $1.2 \Omega$<br>Answer: B) $2.4 \Omega$   |     |
| 8.  | If a 60 W light bulb is connected to a 120 V supply, how much current does it draw?<br>A) 0.5 A<br>B) 0.25 A<br>C) 1 A<br>D) 2 A<br>Answer: A) 0.5 A   | CO1 |
| 9.  | A $100 \Omega$ resistor is connected to a 10 V battery. What is the current flowing through the resistor?<br>A) 0.5 A<br>B) 1 A<br>C) 0.1 A<br>D) 10 A<br>Answer: C) 0.1 A   | CO1 |
| 10. | Which of the following is the correct unit for electric power?<br>A) Ohm<br>B) Watt<br>C) Volt<br>D) Ampere<br>Answer: B) Watt   | CO1 |
| 11. | What is the purpose of an MCB (Miniature Circuit Breaker) in a household electrical system?<br>A) Protects against overcurrent<br>B) Provides isolation<br>C) Measures resistance<br>D) Limits power supply<br>Answer: A) Protects against overcurrent | CO1 |
| 12. | The voltage drop across a $4 \Omega$ resistor is 8 V. What is the current through the resistor?<br>A) 1 A<br>B) 2 A<br>C) 4 A<br>D) 8 A<br>Answer: B) 2 A  | CO1 |
| 13. | In a household circuit, what is the function of a fuse?<br>A) Regulates current<br>B) Measures voltage<br>C) Prevents overloading<br>D) Increases power consumption<br>Answer: C) Prevents overloading   | CO1 |
| 14. | A 220 V supply is used to power a 100 W bulb. What current does the bulb draw?<br>A) 0.5 A<br>B) 0.45 A<br>C) 1 A<br>D) 2 A<br>Answer: A) 0.5 A  | CO1 |

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| 15. | <p>What is the purpose of an earthing system in electrical circuits?</p> <p>A) Increases current<br/>B) Reduces resistance<br/>C) Prevents electrical shock<br/>D) Reduces power loss</p> <p>Answer: C) Prevents electrical shock</p>   | CO1 |
| 16. | <p>Which of the following is a type of wiring used for overhead installations?</p> <p>A) Batten wiring<br/>B) Cleat wiring<br/>C) Conduit wiring<br/>D) Surface wiring</p> <p>Answer: B) Cleat wiring</p>   | CO1 |
| 17. | <p>If three resistors, <math>5\ \Omega</math>, <math>10\ \Omega</math>, and <math>15\ \Omega</math>, are connected in parallel, what is the equivalent resistance?</p> <p>A) <math>2\ \Omega</math><br/>B) <math>4\ \Omega</math><br/>C) <math>3\ \Omega</math><br/>D) <math>6\ \Omega</math></p> <p>Answer: A) <math>2\ \Omega</math></p>                                | CO1 |
| 18. | <p>In a three-phase system, which connection is most commonly used for residential applications?</p> <p>A) Delta connection<br/>B) Star connection<br/>C) Zigzag connection<br/>D) Open delta connection</p> <p>Answer: B) Star connection</p>  | CO1 |
| 19. | <p>A circuit contains two resistors: <math>8\ \Omega</math> and <math>4\ \Omega</math>. If they are connected in series across a <math>12\text{ V}</math> supply, what is the total current?</p> <p>A) <math>2\text{ A}</math><br/>B) <math>3\text{ A}</math><br/>C) <math>1\text{ A}</math><br/>D) <math>4\text{ A}</math></p> <p>Answer: A) <math>2\text{ A}</math></p> | CO1 |
| 20. | <p>In which of the following wiring systems are wires embedded in walls and covered with plaster?</p> <p>A) Batten wiring<br/>B) Conduit wiring<br/>C) Surface wiring<br/>D) Cleat wiring</p> <p>Answer: B) Conduit wiring</p>  | CO1 |
| 21. | <p>A <math>220\text{ V}</math> power supply operates a fan drawing <math>3\text{ A}</math> current. What is the power consumed by the fan?</p> <p>A) <math>330\text{ W}</math><br/>B) <math>660\text{ W}</math><br/>C) <math>220\text{ W}</math><br/>D) <math>720\text{ W}</math></p> <p>Answer: B) <math>660\text{ W}</math></p>   | CO1 |
| 22. | <p>What is the resistance of a conductor if the current through it is <math>3\text{ A}</math> and the voltage across it is <math>15\text{ V}</math>?</p> <p>A) <math>5\ \Omega</math><br/>B) <math>3\ \Omega</math><br/>C) <math>10\ \Omega</math></p>  | CO1 |

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|     | D) $15 \Omega$<br>Answer: A) $5 \Omega$  |     |
| 23. | The voltage across the ideal voltmeter in the circuit shown is<br><br>   | CO1 |
|     | A) 10 V<br>B) 8 V<br>C) 6V<br>D) 4 V<br>Answer: B) 8 V   |     |
| 24. | In a two-source circuit, one source acting alone produces 12 mA through a given branch. The other source acting alone produces 10 mA in the opposite direction through the same branch. The actual current through the branch is<br><br>A) 22 mA<br>B) 12 mA<br>C) 10 mA<br>D) 2 mA<br>Answer: A) 2mA  | CO1 |
| 25. | Which of the following is a characteristic of a series circuit?<br><br>A) The current is the same across all components<br>B) The voltage is the same across all components<br>C) The total resistance is the sum of individual resistances<br>D) The total current is the sum of individual currents<br>Answer: C) The total resistance is the sum of individual resistances  | CO1 |
| 26. | In a parallel circuit, how is the total current related to the individual currents?<br><br>A) The total current is the sum of the individual currents<br>B) The total current is the average of the individual currents<br>C) The total current is the difference between the highest and lowest currents<br>D) The total current is equal to the current through the largest resistor<br>Answer: A) The total current is the sum of the individual currents | CO1 |
| 27. | What is the resistance of a conductor if the current is 3 A and the voltage is 9 V?<br><br>A) 1 Ω<br>B) 2 Ω<br>C) 3 Ω<br>D) 4 Ω<br>Answer: B) 3 Ω  | CO1 |
| 28. | In a household circuit, a 100 W bulb and a 60 W bulb are connected in parallel. If the total voltage supply is 220 V, what is the total power consumed?<br><br>A) 160 W<br>B) 180 W<br>C) 200 W  | CO1 |

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|     | D) 220 W<br>Answer: B) 180 W  |     |
| 29. | What is the main purpose of using a circuit breaker in an electrical system?<br>A) To provide electrical isolation<br>B) To prevent electrical shocks<br>C) To protect the circuit from overload<br>D) To measure current flow<br>Answer: C) To protect the circuit from overload | CO1 |
| 30. | A $200\ \Omega$ resistor dissipates 50 W of power. What is the current passing through the resistor?<br>A) 0.5 A<br>B) 1 A<br>C) 2 A<br>D) 0.3 A<br>Answer: B) 1 A  | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**  
**23ES1102- UNIT I – MCQ – SET E**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | <p>A 10 <math>\Omega</math> resistor is connected to a 15 V battery. What is the current flowing through the resistor?</p> <p>A) 0.5 A<br/>         B) 1.5 A<br/>         C) 2 A<br/>         D) 1 A</p> <p>Answer: B) 1.5 A</p>   | CO1  |
| 2.    | <p>In a series circuit, the total resistance of three resistors is 30 <math>\Omega</math>. If two of the resistors have values of 10 <math>\Omega</math> and 15 <math>\Omega</math>, what is the value of the third resistor?</p> <p>A) 5 <math>\Omega</math><br/>         B) 10 <math>\Omega</math><br/>         C) 15 <math>\Omega</math><br/>         D) 25 <math>\Omega</math></p> <p>Answer: A) 5 <math>\Omega</math></p> | CO1  |
| 3.    | <p>If a 10 <math>\Omega</math> resistor dissipates 25 W of power, what is the current passing through the resistor?</p> <p>A) 2 A<br/>         B) 1 A<br/>         C) 0.5 A<br/>         D) 5 A</p> <p>Answer: A) 2 A</p>  | CO1  |
| 4.    | <p>Two resistors, 8 <math>\Omega</math> and 12 <math>\Omega</math>, are connected in parallel. What is the total resistance?</p> <p>A) 4.8 <math>\Omega</math><br/>         B) 10 <math>\Omega</math><br/>         C) 20 <math>\Omega</math><br/>         D) 6 <math>\Omega</math></p> <p>Answer: A) 4.8 <math>\Omega</math></p>   | CO1  |
| 5.    | <p>The resistance of a wire is 8 <math>\Omega</math>, and the current flowing through it is 4 A. What is the power dissipated by the wire?</p> <p>A) 32 W<br/>         B) 64 W<br/>         C) 16 W<br/>         D) 128 W</p> <p>Answer: A) 32 W</p>   | CO1  |
| 6.    | <p>If the voltage across a resistor is 20 V and the resistance is 4 <math>\Omega</math>, what is the power consumed by the resistor?</p> <p>A) 5 W<br/>         B) 10 W<br/>         C) 15 W<br/>         D) 20 W</p> <p>Answer: B) 10 W</p>   | CO1  |

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| 7.  | A 50 W, 220 V light bulb is connected in series with a $10 \Omega$ resistor. What is the current flowing through the circuit?<br>A) 0.5 A<br>B) 1 A<br>C) 2 A<br>D) 3 A<br><br>Answer: B) 1 A  | CO1 |
| 8.  | A 120 V voltage source is connected to a $10 \Omega$ resistor. What is the current flowing through the resistor?<br>A) 12 A<br>B) 8 A<br>C) 15 A<br>D) 10 A<br><br>Answer: B) 12 A   | CO1 |
| 9.  | In a parallel circuit, the current supplied is 10 A. If the resistances are $2 \Omega$ and $4 \Omega$ , what is the total current passing through the resistors?<br>A) 12 A<br>B) 5 A<br>C) 10 A<br>D) 8 A<br><br>Answer: C) 10 A  | CO1 |
| 10. | What is the total power consumed in a circuit containing three resistors of $4 \Omega$ , $6 \Omega$ , and $10 \Omega$ connected in series across a 24 V supply?<br>A) 48 W<br>B) 36 W<br>C) 24 W<br>D) 12 W<br><br>Answer: B) 36 W   | CO1 |
| 11. | A $100 \Omega$ resistor is connected to a 10 V battery. What is the power dissipated in the resistor?<br>A) 1 W<br>B) 2 W<br>C) 10 W<br>D) 100 W<br><br>Answer: A) 1 W   | CO1 |
| 12. | Which of the following is a characteristic of a series circuit?<br>A) The current is the same across all components<br>B) The voltage is the same across all components<br>C) The total resistance is the sum of individual resistances<br>D) The total current is the sum of individual currents<br><br>Answer: C) The total resistance is the sum of individual resistances  | CO1 |
| 13. | In a parallel circuit, how is the total current related to the individual currents?<br>A) The total current is the sum of the individual currents<br>B) The total current is the average of the individual currents<br>C) The total current is the difference between the highest and lowest currents<br>D) The total current is equal to the current through the largest resistor<br><br>Answer: A) The total current is the sum of the individual currents | CO1 |
| 14. | What is the resistance of a conductor if the current is 3 A and the voltage is 9 V?<br>A) $1 \Omega$<br>B) $2 \Omega$<br>C) $3 \Omega$   | CO1 |

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|     | D) $4 \Omega$<br>Answer: B) $3 \Omega$  |     |
| 15. | A 100 W light bulb is connected to a 200 V supply. What is the current flowing through the bulb?<br>A) 0.5 A<br>B) 1 A<br>C) 0.25 A<br>D) 2 A<br>Answer: C) 0.5 A   | CO1 |
| 16. | What is the purpose of earthing in an electrical installation?<br>A) To protect against voltage surges<br>B) To provide a path for excess current to flow into the ground<br>C) To increase the power supply<br>D) To increase the resistance in the circuit<br>Answer: B) To provide a path for excess current to flow into the ground | CO1 |
| 17. | If a circuit has a total resistance of $20 \Omega$ and the voltage supplied is 100 V, what is the current in the circuit?<br>A) 5 A<br>B) 10 A<br>C) 15 A<br>D) 20 A<br>Answer: A) 5 A  | CO1 |
| 18. | Which of the following is the unit of electrical energy?<br>A) Ampere<br>B) Volt<br>C) Watt-hour<br>D) Coulomb<br>Answer: C) Watt-hour  | CO1 |
| 19. | A 12 V battery is connected to two resistors of $2 \Omega$ and $4 \Omega$ in series. What is the total current flowing through the circuit?<br>A) 1 A<br>B) 2 A<br>C) 3 A<br>D) 4 A<br>Answer: A) 1 A   | CO1 |
| 20. | In a parallel circuit, if the resistance of one branch is $10 \Omega$ and the total current is 5 A, what is the current through this branch?<br>A) 0.5 A<br>B) 1 A<br>C) 2 A<br>D) 5 A<br>Answer: A) 0.5 A  | CO1 |
| 21. | What is the total power consumed in a circuit with a 120 V supply and a $60 \Omega$ resistor?<br>A) 240 W<br>B) 120 W<br>C) 60 W<br>D) 30 W<br>Answer: B) 120 W   | CO1 |
| 22. | Which method of analysis involves assigning currents to different loops in a circuit?<br>a) Mesh current analysis   | CO1 |

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|     | b) Node voltage analysis<br>c) Thévenin's theorem<br>d) Superposition analysis<br>Answer: a) Mesh current analysis  |     |
| 23. | What is the formula for calculating total resistance in a series circuit?<br>a) $R_{total} = R_1 + R_2 + R_3 + \dots$<br>b) $R_{total} = 1 / (1/R_1 + 1/R_2 + 1/R_3 + \dots)$<br>c) $R_{total} = R_1 * R_2 * R_3 * \dots$<br>d) $R_{total} = V / I$<br>Answer: a) $R_{total} = R_1 + R_2 + R_3 + \dots$ | CO1 |
| 24. | In an electric circuit, an energy of $9.25 \mu J$ is required to transport $0.5 \mu C$ from point a to point b. What electric potential difference exists between the two points?<br>a) 19.5 V<br>b) 18.5 V<br>c) 18.7V<br>d) 19 V<br>Answer: b) 18.5 V   | CO1 |
| 25. | If two resistors of $6 \Omega$ and $3 \Omega$ are connected in parallel, what is the total resistance?<br>A) $1 \Omega$<br>B) $2 \Omega$<br>C) $3 \Omega$<br>D) $4 \Omega$<br>Answer: B) $2 \Omega$   | CO1 |
| 26. | Which of the following wiring systems is most commonly used in modern electrical installations?<br>A) Cleat wiring<br>B) Batten wiring<br>C) Conduit wiring<br>D) Lead-covered wiring<br>Answer: C) Conduit wiring  | CO1 |
| 27. | In a household circuit, if the voltage is 230 V and the power is 460 W, what is the current drawn by the appliance?<br>A) 1.5 A<br>B) 2 A<br>C) 3 A<br>D) 5 A<br>Answer: B) 2 A   | CO1 |
| 28. | Which of the following components is used to measure the current in a circuit?<br>A) Voltmeter<br>B) Ammeter<br>C) Ohmmeter<br>D) Wattmeter<br>Answer: B) Ammeter   | CO1 |
| 29. | What is the minimum distance between electrical outlets in a residential building?<br>A) 3 meters<br>B) 4 meters<br>C) 5 meters<br>D) 6 meters<br>Answer: C) 5 meters   | CO1 |

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| 30. | What is the voltage across a $20\ \Omega$ resistor when a current of 3 A flows through it?<br>A) 60 V<br>B) 20 V<br>C) 10 V<br>D) 30 V<br>Answer: A) 60 V | CO1 |
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# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – FB – SET A**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | The unit of electrical current is _____.<br><b>Answer:</b> Ampere  | CO1  |
| 2.    | Ohm's Law states that the current passing through a conductor is directly proportional to the _____ and inversely proportional to the _____.<br><b>Answer:</b> Voltage, Resistance | CO1  |
| 3.    | In a series circuit, the total resistance is the _____ of the individual resistances.<br><b>Answer:</b> Sum  | CO1  |
| 4.    | According to Kirchhoff's Voltage Law, the algebraic sum of the voltages around any closed loop or circuit is always _____.<br><b>Answer:</b> Zero                                  | CO1  |
| 5.    | The total current flowing through a parallel circuit is the _____ of the currents through each parallel branch.<br><b>Answer:</b> Sum  | CO1  |
| 6.    | The electrical resistance of a conductor increases with _____ in temperature.<br><b>Answer:</b> Increase   | CO1  |
| 7.    | The unit of electrical power is _____.<br><b>Answer:</b> Watt  | CO1  |
| 8.    | In a parallel circuit, the total voltage across each component is _____.<br><b>Answer:</b> The same  | CO1  |
| 9.    | The _____ is a protective device that is used to detect and prevent overcurrent in a circuit.<br><b>Answer:</b> Fuse   | CO1  |
| 10.   | The resistance of a wire is proportional to its _____ and inversely proportional to its _____.<br><b>Answer:</b> Length, Cross-sectional area                                      | CO1  |
| 11.   | The current flowing through a conductor is _____ to the voltage and _____ to the resistance, according to Ohm's Law.<br><b>Answer:</b> Proportional, Inversely proportional        | CO1  |
| 12.   | A _____ wire is used to connect the metallic parts of electrical appliances to the ground for safety purposes.<br><b>Answer:</b> Earth   | CO1  |
| 13.   | The two main types of earthing systems used in domestic and industrial installations are _____ earthing and _____ earthing.<br><b>Answer:</b> Plate, Rod                           | CO1  |
| 14.   | The current flowing through a resistor is affected by the _____ applied and the _____ of the resistor.<br><b>Answer:</b> Voltage, Resistance                                       | CO1  |
| 15.   | A _____ switch is used for controlling the lighting of staircases from two different locations.<br><b>Answer:</b> Staircase  | CO1  |

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|-----|---|-----|
| 16. | In a full-wave rectifier, the number of diodes typically used is _____.<br><b>Answer:</b> Four  | CO1 |
| 17. | In a simple house wiring system, the _____ is the wire used to carry current, while the _____ wire is used for safety and earthing.<br><b>Answer:</b> Live, Earth                               | CO1 |
| 18. | The power dissipated in a resistor can be calculated using the formula _____, where I is the current and R is the resistance.<br><b>Answer:</b> $P = I^2R$                                      | CO1 |
| 19. | In a DC circuit, the potential difference across a resistor is _____ to the current flowing through it.<br><b>Answer:</b> Directly proportional   | CO1 |
| 20. | A _____ is a device used to control the flow of current by opening or closing a circuit.<br><b>Answer:</b> Switch   | CO1 |
| 21. | The _____ is the rate at which electrical energy is transferred by an electric circuit.<br><b>Answer:</b> Power   | CO1 |
| 22. | The principle of _____ states that the sum of currents entering a junction equals the sum of currents leaving the junction in any electrical circuit.<br><b>Answer:</b> Kirchhoff's Current Law | CO1 |
| 23. | In a typical house wiring system, the _____ wire is used for carrying current, while the _____ wire is used as a return path for the current.<br><b>Answer:</b> Live, Neutral                   | CO1 |
| 24. | A _____ is used in house wiring to protect circuits from overloads and short circuits.<br><b>Answer:</b> Circuit breaker  | CO1 |
| 25. | In a parallel circuit, the total resistance is always _____ than the resistance of the smallest resistor.<br><b>Answer:</b> Less  | CO1 |
| 26. | A _____ is a three-wire connection used to wire a ceiling fan with a light, where the fan and light can be operated separately.<br><b>Answer:</b> Double-pole switch                            | CO1 |
| 27. | In a step-down transformer, the number of turns in the secondary coil is _____ than the number of turns in the primary coil.<br><b>Answer:</b> Less   | CO1 |
| 28. | _____ is the process of transferring electrical energy to the ground through a conductive path to prevent electrical shock hazards.<br><b>Answer:</b> Earthing                                  | CO1 |
| 29. | In a series circuit, the total voltage across all resistors is equal to the sum of the individual _____ drops.<br><b>Answer:</b> Voltage  | CO1 |
| 30. | The current in a parallel circuit is divided among the branches in proportion to their _____.<br><b>Answer:</b> Conductance   | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – FB – SET B**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS   | CO'S |
|-------|---|------|
| 1.    | The unit of electrical charge is _____.<br><b>Answer:</b> Coulomb   | CO1  |
| 2.    | In Ohm's Law, the formula for calculating current is _____.<br><b>Answer:</b> $I = V / R$   | CO1  |
| 3.    | The current in a series circuit is _____ throughout all components.<br><b>Answer:</b> The same  | CO1  |
| 4.    | According to Kirchhoff's Current Law, the sum of currents entering a junction is equal to the sum of currents _____ the junction.<br><b>Answer:</b> Leaving | CO1  |
| 5.    | The _____ is a measure of a material's ability to resist the flow of electric current.<br><b>Answer:</b> Resistance   | CO1  |
| 6.    | The total resistance in a parallel circuit is always _____ than the smallest resistance in the circuit.<br><b>Answer:</b> Less                              | CO1  |
| 7.    | In a house wiring system, the _____ wire is typically used to carry electrical current to the appliances.<br><b>Answer:</b> Live                            | CO1  |
| 8.    | The _____ wire is used to safely return the current to the power source and provides a path for the return current.<br><b>Answer:</b> Neutral               | CO1  |
| 9.    | A _____ switch allows control of a light or fan from two different locations, typically seen in staircases.<br><b>Answer:</b> Two-way                       | CO1  |
| 10.   | In a series circuit, the voltage drop across each resistor is _____ to its resistance.<br><b>Answer:</b> Proportional                                       | CO1  |
| 11.   | The process of using a wire or rod to transfer excess charge safely to the earth is called _____.<br><b>Answer:</b> Earthing                                | CO1  |
| 12.   | The _____ is a device used in electrical circuits to protect the circuit from damage caused by excess current flow.<br><b>Answer:</b> Fuse                  | CO1  |
| 13.   | In a full-wave rectifier, the current flows in the same direction during _____ half-cycles.<br><b>Answer:</b> Both  | CO1  |
| 14.   | The energy dissipated in a resistor is given by the formula _____.<br><b>Answer:</b> $E = I^2Rt$  | CO1  |
| 15.   | A _____ wire is used for grounding electrical appliances to prevent electric shocks.<br><b>Answer:</b> Earth  | CO1  |

|     |   |     |
|-----|---|-----|
| 16. | In a step-up transformer, the voltage in the secondary coil is _____ than the voltage in the primary coil.<br><b>Answer:</b> Higher                               | CO1 |
| 17. | The power dissipated by a resistor is calculated using the formula _____.<br><b>Answer:</b> $P = V^2 / R$   | CO1 |
| 18. | In a parallel circuit, the total current is the _____ of the currents through each branch.<br><b>Answer:</b> Sum  | CO1 |
| 19. | The _____ is used to measure the electrical potential difference between two points in a circuit.<br><b>Answer:</b> Voltmeter                                     | CO1 |
| 20. | The rate at which electrical energy is consumed or generated in a circuit is called _____.<br><b>Answer:</b> Power  | CO1 |
| 21. | In a series circuit, the total resistance is equal to the _____ of the individual resistances.<br><b>Answer:</b> Sum  | CO1 |
| 22. | In a DC motor, the current is supplied to the rotor through a _____.<br><b>Answer:</b> Commutator   | CO1 |
| 23. | The _____ is a safety measure used to disconnect the power supply if there is an electrical fault in the circuit.<br><b>Answer:</b> Circuit breaker               | CO1 |
| 24. | A _____ rectifier uses only one half of the input signal to produce a unidirectional current.<br><b>Answer:</b> Half-wave   | CO1 |
| 25. | A _____ is used to measure the electrical current flowing through a circuit.<br><b>Answer:</b> Ammeter  | CO1 |
| 26. | In an electrical circuit, the total voltage across resistors in series is _____ to the sum of individual voltage drops.<br><b>Answer:</b> Equal                   | CO1 |
| 27. | The current in a parallel circuit is inversely proportional to the _____ of the resistances in the branches.<br><b>Answer:</b> Resistance                         | CO1 |
| 28. | The _____ is a device used in house wiring to prevent overloading and short-circuiting by breaking the circuit.<br><b>Answer:</b> MCB (Miniature Circuit Breaker) | CO1 |
| 29. | In a house wiring system, the _____ wire is often insulated with a blue color.<br><b>Answer:</b> Neutral  | CO1 |
| 30. | The primary purpose of earthing in electrical systems is to ensure that any leakage current is safely discharged to the _____.<br><b>Answer:</b> Ground           | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – FB – SET C**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| <b>SL.NO</b> | <b>QUESTIONS</b>   | <b>CO'S</b> |
|--------------|--|-------------|
| 1.           | The unit of electrical potential difference is _____.<br><b>Answer:</b> Volt   | CO          |
| 2.           | Ohm's Law states that the current flowing through a conductor is directly proportional to the _____ and inversely proportional to the _____.<br><b>Answer:</b> Voltage, Resistance | CO1         |
| 3.           | The total resistance in a parallel circuit is _____ than the smallest resistance in the circuit.<br><b>Answer:</b> Less  | CO1         |
| 4.           | In a series circuit, the current flowing through all components is _____.<br><b>Answer:</b> The same   | CO1         |
| 5.           | The total voltage across all components in a series circuit is equal to the sum of the individual _____ drops.<br><b>Answer:</b> Voltage   | CO1         |
| 6.           | Kirchhoff's Voltage Law states that the sum of the voltage drops in any closed loop in a circuit is always _____.<br><b>Answer:</b> Zero   | CO1         |
| 7.           | The total current in a parallel circuit is the _____ of the currents through the individual branches.<br><b>Answer:</b> Sum  | CO1         |
| 8.           | In a house wiring system, the _____ wire is used for safety and earthing.<br><b>Answer:</b> Earth  | CO1         |
| 9.           | The _____ is used to disconnect a circuit automatically in case of overcurrent.<br><b>Answer:</b> Fuse   | CO1         |
| 10.          | The current flowing through a resistor is directly proportional to the _____ across it.<br><b>Answer:</b> Voltage  | CO1         |
| 11.          | The _____ switch is commonly used to control the light or fan from two different locations in a staircase.<br><b>Answer:</b> Two-way   | CO1         |
| 12.          | In a full-wave rectifier, the current flows in the same direction during _____ half-cycles of the input AC signal.<br><b>Answer:</b> Both  | CO1         |
| 13.          | The _____ wire is typically connected to the neutral terminal in house wiring and returns current to the source.<br><b>Answer:</b> Neutral   | CO1         |
| 14.          | The _____ is a safety device used to protect an electrical circuit from damage due to excess current.<br><b>Answer:</b> Circuit breaker  | CO1         |
| 15.          | The resistance of a conductor depends on its _____, _____, and _____.<br><b>Answer:</b> Length, Cross-sectional area, Material   | CO1         |

|     |   |     |
|-----|---|-----|
| 16. | In a DC motor, the rotation of the rotor is controlled by the _____.<br><b>Answer:</b> Commutator   | CO1 |
| 17. | A _____ is a type of diode used for voltage regulation.<br><b>Answer:</b> Zener diode   | CO1 |
| 18. | A _____ is used to measure the potential difference between two points in a circuit.<br><b>Answer:</b> Voltmeter  | CO1 |
| 19. | The _____ is used to measure the amount of current flowing in a circuit.<br><b>Answer:</b> Ammeter  | CO1 |
| 20. | A _____ wire is often used to connect an appliance to the ground for safety purposes.<br><b>Answer:</b> Ground  | CO1 |
| 21. | The total resistance in a series circuit is the _____ of all individual resistances.<br><b>Answer:</b> Sum  | CO1 |
| 22. | The current in a parallel circuit is divided between the branches in proportion to the _____ of each branch.<br><b>Answer:</b> Conductance              | CO1 |
| 23. | The primary function of a _____ is to protect electrical circuits from overloading or short circuits.<br><b>Answer:</b> MCB (Miniature Circuit Breaker) | CO1 |
| 24. | In a step-up transformer, the voltage in the secondary coil is _____ than the voltage in the primary coil.<br><b>Answer:</b> Higher                     | CO1 |
| 25. | The _____ wire in a typical house wiring system is connected to the live terminal and carries current to appliances.<br><b>Answer:</b> Live             | CO1 |
| 26. | The total voltage across the resistors in a parallel circuit is _____ for all the branches.<br><b>Answer:</b> The same                                  | CO1 |
| 27. | The power dissipated in a resistor is given by the formula _____.<br><b>Answer:</b> $P = V^2 / R$   | CO1 |
| 28. | In an electrical circuit, the total current is the _____ of the individual currents in each branch of the circuit.<br><b>Answer:</b> Sum                | CO1 |
| 29. | The _____ is used to measure the amount of electrical power consumed by an electrical device.<br><b>Answer:</b> Wattmeter                               | CO1 |
| 30. | A _____ is a device used to convert AC to DC current.<br><b>Answer:</b> Rectifier   | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – FB – SET D**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | The unit of electrical power is _____.<br><b>Answer:</b> Watt  | CO1  |
| 2.    | The principle that states that the total power entering a circuit is equal to the total power leaving the circuit is known as _____.<br><b>Answer:</b> The Law of Conservation of Energy   | CO1  |
| 3.    | The unit of electrical resistance is _____.<br><b>Answer:</b> Ohm  | CO1  |
| 4.    | In a step-down transformer, the voltage in the secondary coil is _____ than the voltage in the primary coil.<br><b>Answer:</b> Lower   | CO1  |
| 5.    | The current flowing through a resistor can be calculated by using the formula _____.<br><b>Answer:</b> $I = V / R$   | CO1  |
| 6.    | The total current in a series circuit is the same through all components, as there is only _____ path for the current to flow.<br><b>Answer:</b> One   | CO1  |
| 7.    | In a parallel circuit, the _____ remains the same across all branches.<br><b>Answer:</b> Voltage   | CO1  |
| 8.    | In house wiring, the color code for the live wire is usually _____.<br><b>Answer:</b> Red or Brown   | CO1  |
| 9.    | The color of the neutral wire in a typical household circuit is _____.<br><b>Answer:</b> Blue  | CO1  |
| 10.   | The _____ is a device that automatically disconnects a circuit when the current exceeds a safe value.<br><b>Answer:</b> Fuse   | CO1  |
| 11.   | The total resistance in a parallel circuit can be calculated by taking the reciprocal of the sum of the reciprocals of the individual resistances, i.e., _____.<br><b>Answer:</b> $1/R_{\text{total}} = 1/R_1 + 1/R_2 + \dots + 1/R_n$ | CO1  |
| 12.   | The _____ law is used to determine the total voltage drop around a closed loop in a circuit.<br><b>Answer:</b> Kirchhoff's Voltage Law   | CO1  |
| 13.   | In a DC circuit, the voltage drop across a resistor is directly proportional to the _____ passing through it.<br><b>Answer:</b> Current  | CO1  |
| 14.   | The _____ wire is connected to the metal casing of appliances to provide a safe path to ground in case of faults.<br><b>Answer:</b> Earth  | CO1  |
| 15.   | In a series circuit, the _____ remains constant for all components.<br><b>Answer:</b> Current  | CO1  |
| 16.   | A _____ is used to store electrical energy in the form of an electric field.<br><b>Answer:</b> Capacitor   | CO1  |

|     |  |     |
|-----|--|-----|
| 17. | The _____ of a conductor is inversely proportional to its cross-sectional area.<br><b>Answer:</b> Resistance   | CO1 |
| 18. | A _____ transformer is used to increase or decrease AC voltage in a circuit.<br><b>Answer:</b> Transformer   | CO1 |
| 19. | The primary purpose of a _____ is to break the circuit if an overcurrent is detected.<br><b>Answer:</b> Circuit breaker  | CO1 |
| 20. | The unit of electrical energy is _____.<br><b>Answer:</b> Joule  | CO1 |
| 21. | The main function of a _____ in house wiring is to limit the amount of current that can flow through the circuit.<br><b>Answer:</b> Fuse   | CO1 |
| 22. | In an electrical circuit, the _____ is used to open or close the circuit to control the flow of current.<br><b>Answer:</b> Switch  | CO1 |
| 23. | The resistance of a wire is proportional to its _____ and inversely proportional to its _____.<br><b>Answer:</b> Length, Cross-sectional area  | CO1 |
| 24. | In a transformer, the voltage ratio is equal to the ratio of the _____.<br><b>Answer:</b> Number of turns in the primary coil to the number of turns in the secondary coil               | CO1 |
| 25. | The _____ is a device used to convert alternating current (AC) to direct current (DC).<br><b>Answer:</b> Rectifier   | CO1 |
| 26. | In a series circuit, the total power consumed is equal to the sum of the _____ consumed by each resistor.<br><b>Answer:</b> Power  | CO1 |
| 27. | The _____ is the rate at which electrical energy is converted into another form of energy, such as heat or light.<br><b>Answer:</b> Power  | CO1 |
| 28. | The unit of electrical power is _____.<br><b>Answer:</b> Watt  | CO1 |
| 29. | The principle that states that the total power entering a circuit is equal to the total power leaving the circuit is known as _____.<br><b>Answer:</b> The Law of Conservation of Energy | CO1 |
| 30. | The unit of electrical resistance is _____.<br><b>Answer:</b> Ohm  | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – FB – SET E**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS   | CO'S |
|-------|---|------|
| 1.    | The resistance of a conductor is _____ to its length and _____ to its cross-sectional area.<br><b>Answer:</b> Proportional, Inversely proportional  | CO1  |
| 2.    | In a parallel circuit, the voltage across each resistor is _____.<br><b>Answer:</b> The same  | CO1  |
| 3.    | The _____ is the point in an electrical circuit where the current splits into two or more branches.<br><b>Answer:</b> Junction                      | CO1  |
| 4.    | The current in a series circuit is _____ to the total resistance.<br><b>Answer:</b> Inversely proportional  | CO1  |
| 5.    | The _____ is used to protect the circuit by automatically switching off when an overload occurs.<br><b>Answer:</b> Overload relay                   | CO1  |
| 6.    | In a simple DC motor, the mechanical power output is directly related to the _____ and _____.<br><b>Answer:</b> Current, Voltage                    | CO1  |
| 7.    | A _____ circuit is one where all components are connected end to end, forming a single path for current to flow.<br><b>Answer:</b> Series           | CO1  |
| 8.    | In a step-down transformer, the number of turns in the primary coil is _____ than in the secondary coil.<br><b>Answer:</b> Greater                  | CO1  |
| 9.    | The primary function of an electrical fuse is to _____ the circuit in case of excessive current.<br><b>Answer:</b> Break                            | CO1  |
| 10.   | The current in a parallel circuit is _____ by the inverse of the resistances in each branch.<br><b>Answer:</b> Divided                              | CO1  |
| 11.   | In a series circuit, the total resistance is always _____ than the resistance of the smallest resistor.<br><b>Answer:</b> Greater                   | CO1  |
| 12.   | In a transformer, the voltage in the secondary coil is determined by the _____ of turns in the primary and secondary coils.<br><b>Answer:</b> Ratio | CO1  |
| 13.   | The _____ is a device used to control the flow of current and protect against overloads.<br><b>Answer:</b> Circuit breaker                          | CO1  |
| 14.   | The primary coil of a transformer is connected to the _____ supply.<br><b>Answer:</b> Input   | CO1  |
| 15.   | In house wiring, the _____ wire is used for connecting the metal parts of appliances to the ground.<br><b>Answer:</b> Earth                         | CO1  |

|     |  |     |
|-----|--|-----|
| 16. | The _____ principle is used in a transformer to change voltage levels in AC circuits.<br><b>Answer:</b> Electromagnetic induction                  | CO1 |
| 17. | The power factor of a resistive load is _____.<br><b>Answer:</b> One   | CO1 |
| 18. | In a household circuit, a _____ switch controls the flow of electricity from the main power supply to appliances.<br><b>Answer:</b> Main           | CO1 |
| 19. | A _____ is a type of switch used to control a light or appliance from multiple locations.<br><b>Answer:</b> Three-way switch                       | CO1 |
| 20. | The _____ motor is commonly used for high torque applications like elevators and conveyor belts.<br><b>Answer:</b> Servo motor                     | CO1 |
| 21. | A _____ is used in circuits to protect against excess current by disconnecting the circuit.<br><b>Answer:</b> Fuse                                 | CO1 |
| 22. | The _____ rectifier is used to convert AC into DC, using both halves of the AC waveform.<br><b>Answer:</b> Full-wave                               | CO1 |
| 23. | In a DC motor, the direction of rotation is determined by the _____ current supplied to the field windings.<br><b>Answer:</b> Direction of         | CO1 |
| 24. | The _____ relay is used to protect an electrical motor from damage due to overload conditions.<br><b>Answer:</b> Thermal overload                  | CO1 |
| 25. | A _____ is used in circuits to measure the electrical resistance.<br><b>Answer:</b> Ohmmeter   | CO1 |
| 26. | The _____ is the part of the circuit that provides the electrical energy to power the load.<br><b>Answer:</b> Source                               | CO1 |
| 27. | The resistance of a conductor is _____ to its length and _____ to its cross-sectional area.<br><b>Answer:</b> Proportional, Inversely proportional | CO1 |
| 28. | In a parallel circuit, the voltage across each resistor is _____.<br><b>Answer:</b> The same   | CO1 |
| 29. | The _____ is the point in an electrical circuit where the current splits into two or more branches.<br><b>Answer:</b> Junction                     | CO1 |
| 30. | The current in a series circuit is _____ to the total resistance.<br><b>Answer:</b> Inversely proportional   | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – T or F / MATCH – SET A**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS   | CO'S |
|-------|---|------|
| 1.    | Ohm's Law states that the current flowing through a conductor is directly proportional to the voltage and inversely proportional to the resistance.<br><br>Answer: True | CO1  |
| 2.    | In a series circuit, the total current is the sum of the currents through each component.<br><br>Answer: False  | CO1  |
| 3.    | Kirchhoff's Voltage Law states that the sum of the voltages in a closed loop is equal to zero.<br><br>Answer: True  | CO1  |
| 4.    | In a parallel circuit, the total resistance is the sum of the individual resistances.<br><br>Answer: False  | CO1  |
| 5.    | A fuse protects the circuit by allowing excess current to pass through safely.<br><br>Answer: False   | CO1  |
| 6.    | In a parallel connection, the voltage across each resistor is the same.<br><br>Answer: True   | CO1  |
| 7.    | The neutral wire in a house wiring system carries the same current as the live wire but with opposite polarity.<br><br>Answer: True                                     | CO1  |
| 8.    | An earth wire is used to protect electrical equipment from high voltage surges.<br><br>Answer: True   | CO1  |
| 9.    | The power consumed by a resistor in a series circuit is directly proportional to the total resistance.<br><br>Answer: False   | CO1  |
| 10.   | In a star connection, the neutral point is formed by connecting the ends of all phase windings together.<br><br>Answer: True  | CO1  |
| 11.   | The current in a series circuit is inversely proportional to the total resistance.<br><br>Answer: True  | CO1  |
| 12.   | The primary function of the live wire is to return current to the source in a house wiring system.<br><br>Answer: False   | CO1  |
| 13.   | In staircase wiring, a two-way switch allows control of the light from two locations.<br><br>Answer: True   | CO1  |
| 14.   | The earth leakage circuit breaker (ELCB) works by detecting a voltage imbalance between live and neutral wires.<br><br>Answer: True                                     | CO1  |
| 15.   | A capacitor in a ceiling fan circuit is used to reduce the speed of the fan.<br><br>Answer: False   | CO1  |
| 16.   | In a parallel circuit, the total current is the sum of the currents flowing through each branch.<br><br>Answer: True  | CO1  |

| 17.                   | In a series connection, the voltage across each component is the same.<br>Answer: False  | CO1      |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
|-----------------------|--|----------|----------|-------------------|--|-----------------------|----------------------------------|-------------------|-------------------------|---------------------|----------------------------------|-----|
| 18.                   | A diode in a rectifier circuit allows current to flow in both directions.<br>Answer: False   | CO1      |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| 19.                   | The earth wire provides a safe path for the current to flow into the ground in case of a fault.<br>Answer: True  | CO1      |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| 20.                   | In an electrical system, earthing provides protection against electric shock and short circuits.<br>Answer: True   | CO1      |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| MATCH THE FOLLOWING   |  | CO1      |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| 21.                   | <p>Electrical Quantities</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Ohm's Law</td> <td>1. Relationship between current and voltage</td> </tr> <tr> <td>B. Kirchhoff's Law</td> <td>2. Sum of voltages around a loop</td> </tr> <tr> <td>C. Series Circuit</td> <td>3. Current is the same</td> </tr> <tr> <td>D. Parallel Circuit</td> <td>4. Voltage is the same</td> </tr> </tbody> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p>Answer: Option 1</p> | Column A | Column B | A. Ohm's Law      | 1. Relationship between current and voltage  | B. Kirchhoff's Law    | 2. Sum of voltages around a loop | C. Series Circuit | 3. Current is the same  | D. Parallel Circuit | 4. Voltage is the same           | CO1 |
| Column A              | Column B   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| A. Ohm's Law          | 1. Relationship between current and voltage  |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| B. Kirchhoff's Law    | 2. Sum of voltages around a loop   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| C. Series Circuit     | 3. Current is the same   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| D. Parallel Circuit   | 4. Voltage is the same   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| 22.                   | <p>Types of Wiring</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Conduit Wiring</td> <td>1. Encloses electrical wiring</td> </tr> <tr> <td>B. Casing and Capping</td> <td>2. Uses wooden strips</td> </tr> <tr> <td>C. Batten Wiring</td> <td>3. Uses wooden battens</td> </tr> <tr> <td>D. Cleat Wiring</td> <td>4. Uses porcelain cleats</td> </tr> </tbody> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p>Answer: Option 2</p>                           | Column A | Column B | A. Conduit Wiring | 1. Encloses electrical wiring                | B. Casing and Capping | 2. Uses wooden strips            | C. Batten Wiring  | 3. Uses wooden battens  | D. Cleat Wiring     | 4. Uses porcelain cleats         | CO1 |
| Column A              | Column B   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| A. Conduit Wiring     | 1. Encloses electrical wiring  |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| B. Casing and Capping | 2. Uses wooden strips  |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| C. Batten Wiring      | 3. Uses wooden battens   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| D. Cleat Wiring       | 4. Uses porcelain cleats   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| 23.                   | <p>Electrical Tools</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Multimeter</td> <td>1. Measures voltage, current, and resistance</td> </tr> <tr> <td>B. Screwdriver</td> <td>2. Tightens or loosens screws</td> </tr> <tr> <td>C. Pliers</td> <td>3. Holds or bends wires</td> </tr> <tr> <td>D. Wire Stripper</td> <td>4. Removes insulation from wires</td> </tr> </tbody> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 3, C - 4, D - 2</li> <li>2. A - 2, B - 1, C - 3, D - 4</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 2, C - 3, D - 1</li> </ol> <p>Answer: Option 1</p>           | Column A | Column B | A. Multimeter     | 1. Measures voltage, current, and resistance | B. Screwdriver        | 2. Tightens or loosens screws    | C. Pliers         | 3. Holds or bends wires | D. Wire Stripper    | 4. Removes insulation from wires | CO1 |
| Column A              | Column B   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| A. Multimeter         | 1. Measures voltage, current, and resistance   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| B. Screwdriver        | 2. Tightens or loosens screws  |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| C. Pliers             | 3. Holds or bends wires  |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |
| D. Wire Stripper      | 4. Removes insulation from wires   |          |          |                   |  |                       |                                  |                   |                         |                     |                                  |     |

|                                     |   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
|-------------------------------------|---|----------|----------|--------------------|----------------------------------|---------------------|-----------------------------------|-------------------------------------|---------------------------------------|--------------------|---------------------------------------|-----|
| 24.                                 | <p><b>Safety Measures</b></p> <table border="0"> <tr> <td style="vertical-align: top; width: 50%;">Column A</td><td style="vertical-align: top; width: 50%;">Column B</td></tr> <tr> <td>A. Insulated Tools</td><td>1. Reduce risk of electric shock</td></tr> <tr> <td>B. Circuit Breaker</td><td>2. Cuts off power during overload</td></tr> <tr> <td>C. Ground Fault Circuit Interrupter</td><td>3. Trips when current leaks to ground</td></tr> <tr> <td>D. Surge Protector</td><td>4. Protects against electrical surges</td></tr> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 2, C - 1, D - 3</li> </ol> <p>Answer: Option 1</p> | Column A | Column B | A. Insulated Tools | 1. Reduce risk of electric shock | B. Circuit Breaker  | 2. Cuts off power during overload | C. Ground Fault Circuit Interrupter | 3. Trips when current leaks to ground | D. Surge Protector | 4. Protects against electrical surges | CO1 |
| Column A                            | Column B  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| A. Insulated Tools                  | 1. Reduce risk of electric shock  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| B. Circuit Breaker                  | 2. Cuts off power during overload   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| C. Ground Fault Circuit Interrupter | 3. Trips when current leaks to ground   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| D. Surge Protector                  | 4. Protects against electrical surges   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| 25.                                 | <p><b>Types of Circuits</b></p> <table border="0"> <tr> <td style="vertical-align: top; width: 50%;">Column A</td><td style="vertical-align: top; width: 50%;">Column B</td></tr> <tr> <td>A. Series Circuit</td><td>1. Current is the same</td></tr> <tr> <td>B. Parallel Circuit</td><td>2. Voltage is the same</td></tr> <tr> <td>C. Combination Circuit</td><td>3. Mix of series and parallel</td></tr> <tr> <td>D. Short Circuit</td><td>4. Low resistance path</td></tr> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p>Answer: Option 1</p>  | Column A | Column B | A. Series Circuit  | 1. Current is the same           | B. Parallel Circuit | 2. Voltage is the same            | C. Combination Circuit              | 3. Mix of series and parallel         | D. Short Circuit   | 4. Low resistance path                | CO1 |
| Column A                            | Column B  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| A. Series Circuit                   | 1. Current is the same  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| B. Parallel Circuit                 | 2. Voltage is the same  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| C. Combination Circuit              | 3. Mix of series and parallel   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| D. Short Circuit                    | 4. Low resistance path  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| 26.                                 | <p><b>Types of Fuses</b></p> <table border="0"> <tr> <td style="vertical-align: top; width: 50%;">Column A</td><td style="vertical-align: top; width: 50%;">Column B</td></tr> <tr> <td>A. Cartridge Fuse</td><td>1. Sealed in a cartridge</td></tr> <tr> <td>B. Rewirable Fuse</td><td>2. Wire can be replaced</td></tr> <tr> <td>C. Drop-out Fuse</td><td>3. High voltage applications</td></tr> <tr> <td>D. Resettable Fuse</td><td>4. Can be reset after tripping</td></tr> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 4, B - 2, C - 3, D - 1</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 2, B - 3, C - 1, D - 4</li> <li>4. A - 3, B - 4, C - 1, D - 2</li> </ol> <p>Answer: Option 2</p>   | Column A | Column B | A. Cartridge Fuse  | 1. Sealed in a cartridge         | B. Rewirable Fuse   | 2. Wire can be replaced           | C. Drop-out Fuse                    | 3. High voltage applications          | D. Resettable Fuse | 4. Can be reset after tripping        | CO1 |
| Column A                            | Column B  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| A. Cartridge Fuse                   | 1. Sealed in a cartridge  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| B. Rewirable Fuse                   | 2. Wire can be replaced   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| C. Drop-out Fuse                    | 3. High voltage applications  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| D. Resettable Fuse                  | 4. Can be reset after tripping  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| 27.                                 | <p><b>Electrical Components</b></p> <table border="0"> <tr> <td style="vertical-align: top; width: 50%;">Column A</td><td style="vertical-align: top; width: 50%;">Column B</td></tr> <tr> <td>A. Resistor</td><td>1. Limits current</td></tr> <tr> <td>B. Capacitor</td><td>2. Stores electrical energy</td></tr> <tr> <td>C. Inductor</td><td>3. Stores magnetic energy</td></tr> <tr> <td>D. Diode</td><td>4. Allows current in one direction</td></tr> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> </ol>   | Column A | Column B | A. Resistor        | 1. Limits current                | B. Capacitor        | 2. Stores electrical energy       | C. Inductor                         | 3. Stores magnetic energy             | D. Diode           | 4. Allows current in one direction    | CO1 |
| Column A                            | Column B  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| A. Resistor                         | 1. Limits current   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| B. Capacitor                        | 2. Stores electrical energy   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| C. Inductor                         | 3. Stores magnetic energy   |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |
| D. Diode                            | 4. Allows current in one direction  |          |          |                    |                                  |                     |                                   |                                     |                                       |                    |                                       |     |

|                          | <p>2. A - 2, B - 3, C - 4, D - 1<br/>     3. A - 3, B - 4, C - 1, D - 2<br/>     4. A - 4, B - 1, C - 2, D - 3</p> <p>Answer: Option 1</p>   |          |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |
|--------------------------|--|----------|----------|------------------------|----------------------|--------------------------|----------------------|--------------------------|----------------------------------|--------------------|----------------------------|-----|
| 28.                      | <p>Electrical Power</p> <p>Column A Column B</p> <p>A. Power 1. Measured in watts<br/>     B. Energy 2. Measured in joules<br/>     C. Voltage 3. Potential difference<br/>     D. Current 4. Flow of electric charge</p> <p>Options:</p> <p>1. A - 1, B - 2, C - 3, D - 4<br/>     2. A - 2, B - 3, C - 4, D - 1<br/>     3. A - 3, B - 4, C - 1, D - 2<br/>     4. A - 4, B - 1, C - 2, D - 3</p> <p>Answer: Option 1</p>  | CO1      |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |
| 29.                      | <p>Basic Components</p> <p>Column A Column B</p> <p>A. Switch 1. Controls the flow of electricity<br/>     B. Socket 2. Provides connection for appliances<br/>     C. Fuse 3. Protects circuit from overload<br/>     D. Conduit 4. Encloses electrical wiring</p> <p>Options:</p> <p>1. A - 1, B - 2, C - 3, D - 4<br/>     2. A - 2, B - 1, C - 4, D - 3<br/>     3. A - 3, B - 4, C - 1, D - 2<br/>     4. A - 4, B - 1, C - 2, D - 3</p> <p>Answer: Option 1</p>  | CO1      |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |
| 30.                      | <p>Types of Transformers</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Step-up Transformer</td> <td>1. Increases voltage</td> </tr> <tr> <td>B. Step-down Transformer</td> <td>2. Decreases voltage</td> </tr> <tr> <td>C. Isolation Transformer</td> <td>3. Provides electrical isolation</td> </tr> <tr> <td>D. Autotransformer</td> <td>4. Variable voltage output</td> </tr> </tbody> </table> <p>Options:</p> <p>1. A - 2, B - 1, C - 3, D - 4<br/>     2. A - 1, B - 2, C - 4, D - 3<br/>     3. A - 1, B - 2, C - 3, D - 4<br/>     4. A - 4, B - 3, C - 2, D - 1</p> <p>Answer: Option 3</p> | Column A | Column B | A. Step-up Transformer | 1. Increases voltage | B. Step-down Transformer | 2. Decreases voltage | C. Isolation Transformer | 3. Provides electrical isolation | D. Autotransformer | 4. Variable voltage output | CO1 |
| Column A                 | Column B   |          |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |
| A. Step-up Transformer   | 1. Increases voltage   |          |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |
| B. Step-down Transformer | 2. Decreases voltage   |          |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |
| C. Isolation Transformer | 3. Provides electrical isolation   |          |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |
| D. Autotransformer       | 4. Variable voltage output   |          |          |                        |                      |                          |                      |                          |                                  |                    |                            |     |

## **Department of EEE**

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – T or F / MATCH – SET B**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | Ohm's Law applies only to resistive components in a circuit.<br>Answer: True   | CO1  |
| 2.    | In a series circuit, the total voltage is the sum of the individual voltages across each component.<br>Answer: True  | CO1  |
| 3.    | Kirchhoff's Current Law (KCL) states that the sum of the voltages at a junction is equal to zero.<br>Answer: False (KCL applies to currents, not voltages.)  | CO1  |
| 4.    | The total resistance in a parallel circuit is higher than the resistance of the largest resistor.<br>Answer: False (In a parallel circuit, the total resistance is always less than the smallest resistor.)  | CO1  |
| 5.    | In an electrical circuit, the neutral wire is used for both carrying current and providing a return path.<br>Answer: True  | CO1  |
| 6.    | A fuse is used to protect electrical devices by limiting the current flow. If the current exceeds the rated value, the fuse blows.<br>Answer: True   | CO1  |
| 7.    | In a series circuit, if one component fails, the entire circuit will stop working.<br>Answer: True   | CO1  |
| 8.    | In a parallel circuit, if one branch is disconnected, the rest of the circuit will continue to function normally.<br>Answer: True  | CO1  |
| 9.    | The main function of the earth wire in a house is to carry the electrical current back to the power source.<br>Answer: False (The earth wire provides a safe path for fault current to the ground.)          | CO1  |
| 10.   | In a three-phase system, the total voltage is the sum of the voltages of the three phases.<br>Answer: False (The total voltage is calculated based on phase voltage and phase difference, not simply a sum.) | CO1  |
| 11.   | The power factor of a purely resistive circuit is 1.<br>Answer: True   | CO1  |
| 12.   | The voltage drop across resistors in a series circuit is proportional to their resistance.<br>Answer: True   | CO1  |
| 13.   | A circuit breaker is a safety device that disconnects the circuit in case of a short circuit or overload to prevent damage.<br>Answer: True  | CO1  |
| 14.   | The total resistance in a series circuit is less than the resistance of the smallest resistor.<br>Answer: False (The total resistance in a series circuit is the sum of all resistances.)                    | CO1  |

|     |  |     |
|-----|--|-----|
| 15. | A capacitor in a fan circuit improves the fan's efficiency and reduces electrical noise.<br>Answer: True   | CO1 |
| 16. | In a house wiring system, the live wire is color-coded blue and the neutral wire is color-coded brown.<br>Answer: False (The live wire is typically brown, and the neutral wire is blue.)  | CO1 |
| 17. | The voltage across the terminals of a battery remains constant, regardless of the current drawn by the load.<br>Answer: False (The voltage may vary depending on the battery's charge and load.)   | CO1 |
| 18. | In a star connection of a three-phase motor, the line voltage is equal to the phase voltage.<br>Answer: False (In a star connection, line voltage is $\sqrt{3}$ times the phase voltage.)  | CO1 |
| 19. | In an electrical circuit, a short circuit happens when the current bypasses the intended path and flows through a low-resistance path.<br>Answer: True   | CO1 |
| 20. | In a step-down transformer, the number of turns in the primary coil is greater than the number of turns in the secondary coil.<br>Answer: True   | CO1 |
|     | MATCH THE FOLLOWING  | CO1 |
| 21. | Electrical Components<br>Column A   Column B<br>A. Resistor   1. Limits current<br>B. Capacitor   2. Stores electrical energy<br>C. Inductor   3. Stores magnetic energy<br>D. Diode   4. Allows current in one direction<br><br>Options:<br>1. A - 1, B - 2, C - 3, D - 4<br>2. A - 2, B - 3, C - 4, D - 1<br>3. A - 3, B - 4, C - 1, D - 2<br>4. A - 4, B - 1, C - 2, D - 3<br><br>Answer: Option 1                    | CO1 |
| 22. | Basic Components<br>Column A   Column B<br>A. Switch   1. Controls the flow of electricity<br>B. Socket   2. Provides connection for appliances<br>C. Fuse   3. Protects circuit from overload<br>D. Conduit   4. Encloses electrical wiring<br><br>Options:<br>1. A - 1, B - 2, C - 3, D - 4<br>2. A - 2, B - 1, C - 4, D - 3<br>3. A - 3, B - 4, C - 1, D - 2<br>4. A - 4, B - 1, C - 2, D - 3<br><br>Answer: Option 1 | CO1 |
| 23. | Types of Transformers<br>Column A                  Column B<br>A. Step-up Transformer   1. Increases voltage<br>B. Step-down Transformer   2. Decreases voltage  | CO1 |

|     |  |     |
|-----|--|-----|
|     | <p>C. Isolation Transformer    3. Provides electrical isolation</p> <p>D. Autotransformer        4. Variable voltage output</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 3, D - 4</li> <li>2. A - 1, B - 2, C - 4, D - 3</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p>Answer: Option 3</p>   |     |
| 24. | <p>Electrical Power</p> <p>Column A   Column B</p> <p>A. Power   1. Measured in watts</p> <p>B. Energy   2. Measured in joules</p> <p>C. Voltage   3. Potential difference</p> <p>D. Current   4. Flow of electric charge</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p>Answer: Option 1</p>   | CO1 |
| 25. | <p>Match the following for Ohm's Law:</p> <p>Column A   Column B</p> <p>A. Voltage   1. <math>V = IR</math></p> <p>B. Current   2. <math>I = V/R</math></p> <p>C. Resistance   3. <math>R = V/I</math></p> <p>D. Power      4. <math>P = VI</math></p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 1, C - 4, D - 3</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p>Answer: Option 1</p>  | CO1 |
| 26. | <p>Match the following for Kirchhoff's Laws:</p> <p>Column A                  Column B</p> <p>A. Kirchhoff's Voltage Law   1. Sum of voltages in a loop</p> <p>B. Kirchhoff's Current Law   2. Sum of currents at a junction</p> <p>C. Series Circuit            3. Current is the same</p> <p>D. Parallel Circuit         4. Voltage is the same</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 1, C - 4, D - 3</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p>Answer: Option 1</p> | CO1 |
| 27. | <p>Match the following for Earthing and its Types:</p> <p>Column A                  Column B</p> <p>A. Safety Earthing        1. Prevents electric shock</p>   | CO1 |

|     |   |     |
|-----|---|-----|
|     | <p>B. Equipment Earthing    2. Connects equipment to ground<br/> C. Functional Earthing    3. Maintains system stability<br/> D. System Earthing    4. Maintains voltage at reference level</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p>Answer: Option 2</p>  |     |
| 28. | <p>Match the following for Basic House Wiring:</p> <p>Column A    Column B</p> <p>A. Switch    1. Controls flow of electricity<br/> B. Socket    2. Connection for appliances<br/> C. Conduit    3. Protects electrical wiring<br/> D. Fuse    4. Prevents overloading</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 3, B - 4, C - 1, D - 2</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 4, B - 1, C - 2, D - 3</li> <li>4. A - 2, B - 3, C - 4, D - 1</li> </ol> <p>Answer: Option 2</p>   | CO1 |
| 29. | <p>Match the following for Tools and Components:</p> <p>Column A    Column B</p> <p>A. Multimeter    1. Measures voltage and current<br/> B. Screwdriver    2. Tightens or loosens screws<br/> C. Pliers    3. Holds or bends wires<br/> D. Wire Stripper    4. Removes insulation from wires</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 2, B - 3, C - 4, D - 1</li> <li>2. A - 4, B - 1, C - 3, D - 2</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 3, B - 4, C - 1, D - 2</li> </ol> <p>Answer: Option 3</p>  | CO1 |
| 30. | <p>Match the following for Different Types of Wiring:</p> <p>Column A                      Column B</p> <p>A. Conduit Wiring              1. Conductors in tubes<br/> B. Casing and Capping Wiring    2. Conductors in wooden strips<br/> C. Batten Wiring                3. Conductors on battens<br/> D. Cleat Wiring                4. Conductors on cleats</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 3, B - 4, C - 1, D - 2</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p>Answer: Option 3</p> | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – T or F / MATCH – SET C**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | Ohm's Law states that the current is inversely proportional to the voltage and directly proportional to the resistance.<br><br>Answer: False           | CO1  |
| 2.    | In a series circuit, the total current is the same across all components.<br><br>Answer: True  | CO1  |
| 3.    | Kirchhoff's Voltage Law is based on the conservation of charge in a circuit.<br><br>Answer: False  | CO1  |
| 4.    | The total resistance in a parallel circuit is always greater than the individual resistances.<br><br>Answer: False                                     | CO1  |
| 5.    | The power consumed by a resistor in a parallel circuit is the same as in a series circuit.<br><br>Answer: False  | CO1  |
| 6.    | In a series circuit, the total voltage is divided among the components based on their resistance.<br><br>Answer: True                                  | CO1  |
| 7.    | Earthing provides protection by offering a low-resistance path for the electric current to flow into the earth in case of a fault.<br><br>Answer: True | CO1  |
| 8.    | In a staircase circuit, the switches used are two-way switches that allow control of the light from two different locations.<br><br>Answer: True       | CO1  |
| 9.    | The earth wire in a home wiring system is typically insulated with green or yellow stripes.<br><br>Answer: True  | CO1  |
| 10.   | In a parallel circuit, the total current is the sum of the currents in each branch.<br><br>Answer: True  | CO1  |
| 11.   | The live wire in a household wiring system is color-coded black.<br><br>Answer: False  | CO1  |
| 12.   | In a star connection, the line current is the same as the phase current.<br><br>Answer: True   | CO1  |
| 13.   | The voltage across each resistor in a series circuit is proportional to the resistance of that resistor.<br><br>Answer: True                           | CO1  |
| 14.   | A capacitor is used in a ceiling fan to improve the efficiency of the motor by creating a phase shift in the current.<br><br>Answer: True              | CO1  |
| 15.   | A circuit breaker is typically used in place of a fuse to protect the circuit from overloads.<br><br>Answer: True                                      | CO1  |

| 16.                        | In a series circuit, the total resistance increases as more resistors are added.<br><br>Answer: True  | CO1      |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
|----------------------------|---|----------|----------|----------------------------|---|----------------------------|-----------------------------------|------------------------|--|--------------------------|----------------------------------|-----|
| 17.                        | The earth wire in a domestic electrical system ensures that any stray current due to insulation failure flows directly to the ground.<br><br>Answer: True   | CO1      |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| 18.                        | A switch in a house wiring system allows the live wire to be either connected or disconnected, thereby controlling the current flow.<br><br>Answer: True  | CO1      |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| 19.                        | In a series circuit, if one component fails, the current through the entire circuit will stop.<br><br>Answer: True  | CO1      |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| 20.                        | In a short circuit, the current bypasses the normal load path and flows through a path with lower resistance.<br><br>Answer: True   | CO1      |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
|                            | MATCH THE FOLLOWING   | CO1      |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| 21.                        | <p><b>Electrical Quantities and Ohm's Law</b></p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Voltage Drop</td> <td>1. Decrease in voltage across a component</td> </tr> <tr> <td>B. Current Flow</td> <td>2. Direction of electron movement</td> </tr> <tr> <td>C. Power Factor</td> <td>3. Ratio of real power to apparent power</td> </tr> <tr> <td>D. Resistance Unit</td> <td>4. Ohms</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 3, D - 4</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 4, B - 3, C - 1, D - 2</li> <li>4. A - 3, B - 4, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 2</p>        | Column A | Column B | A. Voltage Drop            | 1. Decrease in voltage across a component | B. Current Flow            | 2. Direction of electron movement | C. Power Factor        | 3. Ratio of real power to apparent power | D. Resistance Unit       | 4. Ohms                          | CO1 |
| Column A                   | Column B  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| A. Voltage Drop            | 1. Decrease in voltage across a component   |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| B. Current Flow            | 2. Direction of electron movement   |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| C. Power Factor            | 3. Ratio of real power to apparent power  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| D. Resistance Unit         | 4. Ohms   |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| 22.                        | <p>Match the following for Kirchhoff's Laws:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Kirchhoff's Voltage Law</td> <td>1. Sum of voltages in a loop</td> </tr> <tr> <td>B. Kirchhoff's Current Law</td> <td>2. Sum of currents at a junction</td> </tr> <tr> <td>C. Series Circuit</td> <td>3. Current is the same</td> </tr> <tr> <td>D. Parallel Circuit</td> <td>4. Voltage is the same</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 1, C - 4, D - 3</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p><b>Answer:</b> Option 1</p> | Column A | Column B | A. Kirchhoff's Voltage Law | 1. Sum of voltages in a loop              | B. Kirchhoff's Current Law | 2. Sum of currents at a junction  | C. Series Circuit      | 3. Current is the same                   | D. Parallel Circuit      | 4. Voltage is the same           | CO1 |
| Column A                   | Column B  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| A. Kirchhoff's Voltage Law | 1. Sum of voltages in a loop  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| B. Kirchhoff's Current Law | 2. Sum of currents at a junction  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| C. Series Circuit          | 3. Current is the same  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| D. Parallel Circuit        | 4. Voltage is the same  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| 23.                        | <p>Match the following for Series and Parallel Connections:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Series Circuit</td> <td>1. Current is the same</td> </tr> <tr> <td>B. Parallel Circuit</td> <td>2. Voltage is the same</td> </tr> <tr> <td>C. Resistors in Series</td> <td>3. Sum of resistances</td> </tr> <tr> <td>D. Resistors in Parallel</td> <td>4. Reciprocal sum of resistances</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> </ol>   | Column A | Column B | A. Series Circuit          | 1. Current is the same                    | B. Parallel Circuit        | 2. Voltage is the same            | C. Resistors in Series | 3. Sum of resistances                    | D. Resistors in Parallel | 4. Reciprocal sum of resistances | CO1 |
| Column A                   | Column B  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| A. Series Circuit          | 1. Current is the same  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| B. Parallel Circuit        | 2. Voltage is the same  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| C. Resistors in Series     | 3. Sum of resistances   |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |
| D. Resistors in Parallel   | 4. Reciprocal sum of resistances  |          |          |                            |   |                            |                                   |                        |  |                          |                                  |     |

|                        | <p>2. A - 2, B - 3, C - 4, D - 1<br/>     3. A - 3, B - 4, C - 1, D - 2<br/>     4. A - 4, B - 1, C - 2, D - 3</p> <p>Answer: Option 1</p>  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
|------------------------|---|----------|----------|--------------------|---------------------------------|-----------------------|---------------------------------|------------------------|-------------------------------|--------------------|---|-----|
| 24.                    | <p>Match the following for Earthing and its Types:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Safety Earthing</td> <td>1. Prevents electric shock</td> </tr> <tr> <td>B. Equipment Earthing</td> <td>2. Connects equipment to ground</td> </tr> <tr> <td>C. Functional Earthing</td> <td>3. Maintains system stability</td> </tr> <tr> <td>D. System Earthing</td> <td>4. Maintains voltage at reference level</td> </tr> </tbody> </table> <p>Options:</p> <ul style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ul> <p>Answer: Option 2</p> | Column A | Column B | A. Safety Earthing | 1. Prevents electric shock      | B. Equipment Earthing | 2. Connects equipment to ground | C. Functional Earthing | 3. Maintains system stability | D. System Earthing | 4. Maintains voltage at reference level | CO1 |
| Column A               | Column B  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| A. Safety Earthing     | 1. Prevents electric shock  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| B. Equipment Earthing  | 2. Connects equipment to ground   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| C. Functional Earthing | 3. Maintains system stability   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| D. System Earthing     | 4. Maintains voltage at reference level   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| 25.                    | <p>Match the following for Basic House Wiring:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Switch</td> <td>1. Controls flow of electricity</td> </tr> <tr> <td>B. Socket</td> <td>2. Connection for appliances</td> </tr> <tr> <td>C. Conduit</td> <td>3. Protects electrical wiring</td> </tr> <tr> <td>D. Fuse</td> <td>4. Prevents overloading</td> </tr> </tbody> </table> <p>Options:</p> <ul style="list-style-type: none"> <li>1. A - 3, B - 4, C - 1, D - 2</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 4, B - 1, C - 2, D - 3</li> <li>4. A - 2, B - 3, C - 4, D - 1</li> </ul> <p>Answer: Option 2</p>   | Column A | Column B | A. Switch          | 1. Controls flow of electricity | B. Socket             | 2. Connection for appliances    | C. Conduit             | 3. Protects electrical wiring | D. Fuse            | 4. Prevents overloading                 | CO1 |
| Column A               | Column B  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| A. Switch              | 1. Controls flow of electricity   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| B. Socket              | 2. Connection for appliances  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| C. Conduit             | 3. Protects electrical wiring   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| D. Fuse                | 4. Prevents overloading   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| 26.                    | <p>Match the following for Tools and Components:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Multimeter</td> <td>1. Measures voltage and current</td> </tr> <tr> <td>B. Screwdriver</td> <td>2. Tightens or loosens screws</td> </tr> <tr> <td>C. Pliers</td> <td>3. Holds or bends wires</td> </tr> <tr> <td>D. Wire Stripper</td> <td>4. Removes insulation from wires</td> </tr> </tbody> </table> <p>Options:</p> <ul style="list-style-type: none"> <li>1. A - 2, B - 3, C - 4, D - 1</li> <li>2. A - 4, B - 1, C - 3, D - 2</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 3, B - 4, C - 1, D - 2</li> </ul> <p>Answer: Option 3</p>  | Column A | Column B | A. Multimeter      | 1. Measures voltage and current | B. Screwdriver        | 2. Tightens or loosens screws   | C. Pliers              | 3. Holds or bends wires       | D. Wire Stripper   | 4. Removes insulation from wires        | CO1 |
| Column A               | Column B  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| A. Multimeter          | 1. Measures voltage and current   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| B. Screwdriver         | 2. Tightens or loosens screws   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| C. Pliers              | 3. Holds or bends wires   |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| D. Wire Stripper       | 4. Removes insulation from wires  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| 27.                    | <p>Match the following for Types of Circuits:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Series Circuit</td> <td>1. Current is the same</td> </tr> <tr> <td>B. Parallel Circuit</td> <td>2. Voltage is the same</td> </tr> <tr> <td>C. Combination Circuit</td> <td>3. Series and parallel mix</td> </tr> </tbody> </table>  | Column A | Column B | A. Series Circuit  | 1. Current is the same          | B. Parallel Circuit   | 2. Voltage is the same          | C. Combination Circuit | 3. Series and parallel mix    | CO1                |   |     |
| Column A               | Column B  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| A. Series Circuit      | 1. Current is the same  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| B. Parallel Circuit    | 2. Voltage is the same  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |
| C. Combination Circuit | 3. Series and parallel mix  |          |          |                    |                                 |                       |                                 |                        |                               |                    |   |     |

|  | <p>D. Short Circuit                  4. Unintended low resistance path</p> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p>Answer: Option 1</p>  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
|--|--|----------|----------|-----------------------|--------------------------------|------------------------|--|--|---------------------------------------|--------------------|------------------------------------|-----|
| 28.  | <p>Match the following for Safety Measures at Home:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Insulated Tools</td> <td>1. Prevents electric shock</td> </tr> <tr> <td>B. Circuit Breaker</td> <td>2. Cuts off power during faults</td> </tr> <tr> <td>C. Ground Fault Circuit Interrupter (GFCI)</td> <td>3. Trips when current leaks to ground</td> </tr> <tr> <td>D. Surge Protector</td> <td>4. Protects against voltage spikes</td> </tr> </tbody> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p>Answer: Option 1</p> | Column A | Column B | A. Insulated Tools    | 1. Prevents electric shock     | B. Circuit Breaker     | 2. Cuts off power during faults          | C. Ground Fault Circuit Interrupter (GFCI) | 3. Trips when current leaks to ground | D. Surge Protector | 4. Protects against voltage spikes | CO1 |
| Column A                                   | Column B   |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| A. Insulated Tools                         | 1. Prevents electric shock   |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| B. Circuit Breaker                         | 2. Cuts off power during faults  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| C. Ground Fault Circuit Interrupter (GFCI) | 3. Trips when current leaks to ground  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| D. Surge Protector                         | 4. Protects against voltage spikes   |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| 29.  | <p>Match the following for Staircase Wiring:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Two-way Switch</td> <td>1. Controls from two locations</td> </tr> <tr> <td>B. Intermediate Switch</td> <td>2. Controls from three or more locations</td> </tr> <tr> <td>C. Conduit (CO1)</td> <td>3. Encloses and protects wiring</td> </tr> <tr> <td>D. Lamp Holder</td> <td>4. Holds the light bulb</td> </tr> </tbody> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 3, B - 4, C - 1, D - 2</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p>Answer: Option 3</p>                                       | Column A | Column B | A. Two-way Switch     | 1. Controls from two locations | B. Intermediate Switch | 2. Controls from three or more locations | C. Conduit (CO1)                           | 3. Encloses and protects wiring       | D. Lamp Holder     | 4. Holds the light bulb            | CO1 |
| Column A                                   | Column B   |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| A. Two-way Switch                          | 1. Controls from two locations   |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| B. Intermediate Switch                     | 2. Controls from three or more locations   |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| C. Conduit (CO1)                           | 3. Encloses and protects wiring  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| D. Lamp Holder                             | 4. Holds the light bulb  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| 30.  | <p>Match the following for Ceiling Fan Wiring:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Single-phase Motor</td> <td>1. Powers the fan</td> </tr> <tr> <td>B. Capacitor</td> <td>2. Starts the motor</td> </tr> <tr> <td>C. Switch</td> <td>3. Turns fan on and off</td> </tr> <tr> <td>D. Regulator</td> <td>4. Controls fan speed</td> </tr> </tbody> </table> <p>Options:</p> <ol style="list-style-type: none"> <li>1. A - 3, B - 2, C - 4, D - 1</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 4, B - 1, C - 2, D - 3</li> <li>4. A - 2, B - 4, C - 1, D - 3</li> </ol> <p>Answer: Option 2</p>  | Column A | Column B | A. Single-phase Motor | 1. Powers the fan              | B. Capacitor           | 2. Starts the motor                      | C. Switch                                  | 3. Turns fan on and off               | D. Regulator       | 4. Controls fan speed              | CO1 |
| Column A                                   | Column B   |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| A. Single-phase Motor                      | 1. Powers the fan  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| B. Capacitor                               | 2. Starts the motor  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| C. Switch                                  | 3. Turns fan on and off  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |
| D. Regulator                               | 4. Controls fan speed  |          |          |                       |                                |                        |  |  |                                       |                    |                                    |     |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – T or F / MATCH – SET D**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| <b>SL.NO</b> | <b>QUESTIONS</b>   | <b>CO'S</b> |
|--------------|--|-------------|
| 1.           | Ohm's Law applies only to resistive components and does not hold for reactive components like inductors and capacitors.<br><br>Answer: <b>True</b>                   | CO1         |
| 2.           | In a parallel circuit, the total voltage across each component is different and depends on the resistance of each.<br><br>Answer: <b>False</b>                       | CO1         |
| 3.           | Kirchhoff's Current Law states that the sum of all currents entering a junction is equal to the sum of all currents leaving the junction.<br><br>Answer: <b>True</b> | CO1         |
| 4.           | The total resistance in a series circuit is always less than the sum of individual resistances.<br><br>Answer: <b>False</b>  | CO1         |
| 5.           | The neutral wire in a house wiring system carries the same current as the live wire but with opposite polarity.<br><br>Answer: <b>True</b>                           | CO1         |
| 6.           | Earthing in a house wiring system is used to protect electrical appliances from high voltage surges.<br><br>Answer: <b>True</b>                                      | CO1         |
| 7.           | The current in a series circuit remains constant across all components, regardless of their resistance.<br><br>Answer: <b>True</b>                                   | CO1         |
| 8.           | In a step-down transformer, the voltage on the secondary side is higher than on the primary side.<br><br>Answer: <b>False</b>  | CO1         |
| 9.           | The earth wire is used to provide a return path for the current in case of a fault.<br><br>Answer: <b>True</b>   | CO1         |
| 10.          | In a series circuit, if one component fails, the remaining components will continue to function as normal.<br><br>Answer: <b>False</b>                               | CO1         |
| 11.          | In a parallel circuit, the total current is the sum of the individual branch currents.<br><br>Answer: <b>True</b>  | CO1         |
| 12.          | The total resistance in a parallel circuit decreases as more resistors are added to the circuit.<br><br>Answer: <b>True</b>  | CO1         |
| 13.          | A fuse is used to prevent excessive current from flowing through the circuit by melting when the current exceeds a safe level.<br><br>Answer: <b>True</b>            | CO1         |
| 14.          | In a house wiring system, the live wire is the one that is connected to the earth ground.<br><br>Answer: <b>False</b>  | CO1         |

| 15.                        | The current flowing through a resistor is inversely proportional to the total resistance in a series circuit.<br><br>Answer: <b>True</b>  | CO1      |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
|----------------------------|---|----------|----------|----------------------------|------------------------------|----------------------------|----------------------------------|------------------------|-------------------------------|--------------------------|----------------------------------|-----|
| 16.                        | In a star connection of a three-phase system, the line voltage is equal to the phase voltage.<br><br>Answer: <b>False</b>   | CO1      |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| 17.                        | A capacitor in a ceiling fan helps to start the motor by creating a phase difference between the current and voltage.<br><br>Answer: <b>True</b>  | CO1      |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| 18.                        | The voltage drop across resistors in a series circuit is directly proportional to the value of the resistance.<br><br>Answer: <b>True</b>   | CO1      |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| 19.                        | In a household wiring system, the live wire is used to carry the electrical current from the power source to the appliances.<br><br>Answer: <b>True</b>   | CO1      |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| 20.                        | In a short circuit, the current bypasses the normal load path and flows through a path with much higher resistance.<br><br>Answer: <b>False</b>   | CO1      |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
|                            | <b>MATCH THE FOLLOWING</b>  | CO1      |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| 21.                        | <p>Match the following for Kirchhoff's Laws:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 50%;">Column A</th> <th style="text-align: left;">Column B</th> </tr> </thead> <tbody> <tr> <td>A. Kirchhoff's Voltage Law</td> <td>1. Sum of voltages in a loop</td> </tr> <tr> <td>B. Kirchhoff's Current Law</td> <td>2. Sum of currents at a junction</td> </tr> <tr> <td>C. Series Circuit</td> <td>3. Current is the same</td> </tr> <tr> <td>D. Parallel Circuit</td> <td>4. Voltage is the same</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 1, C - 4, D - 3</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p><b>Answer:</b> Option 1</p>   | Column A | Column B | A. Kirchhoff's Voltage Law | 1. Sum of voltages in a loop | B. Kirchhoff's Current Law | 2. Sum of currents at a junction | C. Series Circuit      | 3. Current is the same        | D. Parallel Circuit      | 4. Voltage is the same           | CO1 |
| Column A                   | Column B  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| A. Kirchhoff's Voltage Law | 1. Sum of voltages in a loop  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| B. Kirchhoff's Current Law | 2. Sum of currents at a junction  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| C. Series Circuit          | 3. Current is the same  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| D. Parallel Circuit        | 4. Voltage is the same  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| 22.                        | <p>Match the following for Series and Parallel Connections:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 50%;">Column A</th> <th style="text-align: left;">Column B</th> </tr> </thead> <tbody> <tr> <td>A. Series Circuit</td> <td>1. Current is the same</td> </tr> <tr> <td>B. Parallel Circuit</td> <td>2. Voltage is the same</td> </tr> <tr> <td>C. Resistors in Series</td> <td>3. Sum of resistances</td> </tr> <tr> <td>D. Resistors in Parallel</td> <td>4. Reciprocal sum of resistances</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p><b>Answer:</b> Option 1</p> | Column A | Column B | A. Series Circuit          | 1. Current is the same       | B. Parallel Circuit        | 2. Voltage is the same           | C. Resistors in Series | 3. Sum of resistances         | D. Resistors in Parallel | 4. Reciprocal sum of resistances | CO1 |
| Column A                   | Column B  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| A. Series Circuit          | 1. Current is the same  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| B. Parallel Circuit        | 2. Voltage is the same  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| C. Resistors in Series     | 3. Sum of resistances   |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| D. Resistors in Parallel   | 4. Reciprocal sum of resistances  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| 23.                        | <p>Match the following for Earthing and its Types:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 50%;">Column A</th> <th style="text-align: left;">Column B</th> </tr> </thead> <tbody> <tr> <td>A. Safety Earthing</td> <td>1. Prevents electric shock</td> </tr> <tr> <td>B. Equipment Earthing</td> <td>2. Connects equipment to ground</td> </tr> <tr> <td>C. Functional Earthing</td> <td>3. Maintains system stability</td> </tr> </tbody> </table>  | Column A | Column B | A. Safety Earthing         | 1. Prevents electric shock   | B. Equipment Earthing      | 2. Connects equipment to ground  | C. Functional Earthing | 3. Maintains system stability | CO1                      |                                  |     |
| Column A                   | Column B  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| A. Safety Earthing         | 1. Prevents electric shock  |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| B. Equipment Earthing      | 2. Connects equipment to ground   |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |
| C. Functional Earthing     | 3. Maintains system stability   |          |          |                            |                              |                            |                                  |                        |                               |                          |                                  |     |

|                     | <p>D. System Earthing      4. Maintains voltage at reference level</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 2</p>   |          |          |            |             |            |              |                     |              |          |             |     |
|---------------------|---|----------|----------|------------|-------------|------------|--------------|---------------------|--------------|----------|-------------|-----|
| 24.                 | <p>Match the following for Basic House Wiring:</p> <p><b>Column A Column B</b></p> <p>A. Switch    1. Controls flow of electricity<br/> B. Socket    2. Connection for appliances<br/> C. Conduit   3. Protects electrical wiring<br/> D. Fuse      4. Prevents overloading</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 3, B - 4, C - 1, D - 2</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 4, B - 1, C - 2, D - 3</li> <li>4. A - 2, B - 3, C - 4, D - 1</li> </ol> <p><b>Answer:</b> Option 2</p>  | CO1      |          |            |             |            |              |                     |              |          |             |     |
| 25.                 | <p>Match the following for Ohm's Law:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 50%;">Column A</th> <th style="text-align: left;">Column B</th> </tr> </thead> <tbody> <tr> <td>A. Voltage</td> <td>1. <math>V = IR</math></td> </tr> <tr> <td>B. Current</td> <td>2. <math>I = V/R</math></td> </tr> <tr> <td>C. Resistance (CO1)</td> <td>3. <math>R = V/I</math></td> </tr> <tr> <td>D. Power</td> <td>4. <math>P = VI</math></td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 1, C - 4, D - 3</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 1</p> | Column A | Column B | A. Voltage | 1. $V = IR$ | B. Current | 2. $I = V/R$ | C. Resistance (CO1) | 3. $R = V/I$ | D. Power | 4. $P = VI$ | CO1 |
| Column A            | Column B  |          |          |            |             |            |              |                     |              |          |             |     |
| A. Voltage          | 1. $V = IR$   |          |          |            |             |            |              |                     |              |          |             |     |
| B. Current          | 2. $I = V/R$  |          |          |            |             |            |              |                     |              |          |             |     |
| C. Resistance (CO1) | 3. $R = V/I$  |          |          |            |             |            |              |                     |              |          |             |     |
| D. Power            | 4. $P = VI$   |          |          |            |             |            |              |                     |              |          |             |     |
| 26.                 | <p>Match the following for Tools and Components:</p> <p><b>Column A Column B</b></p> <p>A. Multimeter    1. Measures voltage and current<br/> B. Screwdriver   2. Tightens or loosens screws<br/> C. Pliers          3. Holds or bends wires<br/> D. Wire Stripper   4. Removes insulation from wires</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 2, B - 3, C - 4, D - 1</li> <li>2. A - 4, B - 1, C - 3, D - 2</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 3, B - 4, C - 1, D - 2</li> </ol> <p><b>Answer:</b> Option 3</p>  | CO1      |          |            |             |            |              |                     |              |          |             |     |
| 27.                 | <p>Match the following for Different Types of Wiring:</p> <p><b>Column A Column B</b></p> <p>A. Conduit Wiring            1. Conductors in tubes<br/> B. Casing and Capping Wiring   2. Conductors in wooden strips</p>   | CO1      |          |            |             |            |              |                     |              |          |             |     |

|  | <p>C. Batten Wiring                    3. Conductors on battens<br/> D. Cleat Wiring                    4. Conductors on cleats</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 3, B - 4, C - 1, D - 2</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 3</p>   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
|--|--|----------|----------|--------------------|--------------------------------|------------------------|--|--|---------------------------------------|--------------------|------------------------------------|-----|
| 28.  | <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Power</td> <td>1. Measured in watts</td> </tr> <tr> <td>B. Energy</td> <td>2. Measured in joules</td> </tr> <tr> <td>C. Voltage</td> <td>3. Potential difference</td> </tr> <tr> <td>D. Current</td> <td>4. Flow of electric charge</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p><b>Answer:</b> Option 1</p>  | Column A | Column B | A. Power           | 1. Measured in watts           | B. Energy              | 2. Measured in joules                    | C. Voltage                                 | 3. Potential difference               | D. Current         | 4. Flow of electric charge         | CO1 |
| Column A                                   | Column B   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| A. Power                                   | 1. Measured in watts   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| B. Energy                                  | 2. Measured in joules  |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| C. Voltage                                 | 3. Potential difference  |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| D. Current                                 | 4. Flow of electric charge   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| 29.  | <p>Match the following for Safety Measures at Home:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Insulated Tools</td> <td>1. Prevents electric shock</td> </tr> <tr> <td>B. Circuit Breaker</td> <td>2. Cuts off power during faults</td> </tr> <tr> <td>C. Ground Fault Circuit Interrupter (GFCI)</td> <td>3. Trips when current leaks to ground</td> </tr> <tr> <td>D. Surge Protector</td> <td>4. Protects against voltage spikes</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p><b>Answer:</b> Option 1</p> | Column A | Column B | A. Insulated Tools | 1. Prevents electric shock     | B. Circuit Breaker     | 2. Cuts off power during faults          | C. Ground Fault Circuit Interrupter (GFCI) | 3. Trips when current leaks to ground | D. Surge Protector | 4. Protects against voltage spikes | CO1 |
| Column A                                   | Column B   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| A. Insulated Tools                         | 1. Prevents electric shock   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| B. Circuit Breaker                         | 2. Cuts off power during faults  |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| C. Ground Fault Circuit Interrupter (GFCI) | 3. Trips when current leaks to ground  |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| D. Surge Protector                         | 4. Protects against voltage spikes   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| 30.  | <p>Match the following for Staircase Wiring:</p> <table> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Two-way Switch</td> <td>1. Controls from two locations</td> </tr> <tr> <td>B. Intermediate Switch</td> <td>2. Controls from three or more locations</td> </tr> <tr> <td>C. Conduit</td> <td>3. Encloses and protects wiring</td> </tr> <tr> <td>D. Lamp Holder</td> <td>4. Holds the light bulb</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 3, B - 4, C - 1, D - 2</li> <li>3. A - 1, B - 2, C - 3, D - 4</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 3</p>   | Column A | Column B | A. Two-way Switch  | 1. Controls from two locations | B. Intermediate Switch | 2. Controls from three or more locations | C. Conduit                                 | 3. Encloses and protects wiring       | D. Lamp Holder     | 4. Holds the light bulb            | CO1 |
| Column A                                   | Column B   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| A. Two-way Switch                          | 1. Controls from two locations   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| B. Intermediate Switch                     | 2. Controls from three or more locations   |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| C. Conduit                                 | 3. Encloses and protects wiring  |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |
| D. Lamp Holder                             | 4. Holds the light bulb  |          |          |                    |                                |                        |  |  |                                       |                    |                                    |     |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – T or F / MATCH – SET E**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| <b>SL.NO</b> | <b>QUESTIONS</b>   | <b>CO'S</b> |
|--------------|--|-------------|
| 1.           | Ohm's Law states that current is inversely proportional to voltage and directly proportional to resistance.<br><br>Answer: <b>False</b>  | CO1         |
| 2.           | In a series circuit, the total voltage across all components is equal to the sum of the voltages across each individual component.<br><br>Answer: <b>True</b>  | CO1         |
| 3.           | Kirchhoff's Voltage Law (KVL) states that the sum of all voltages around a closed loop must equal zero.<br><br>Answer: <b>True</b>   | CO1         |
| 4.           | In a parallel circuit, the total resistance is greater than the resistance of the smallest resistor.<br><br>Answer: <b>False</b>   | CO1         |
| 5.           | In a three-phase system, the line current is equal to the phase current in a star connection.<br><br>Answer: <b>False</b>  | CO1         |
| 6.           | Earthing in a house wiring system is important for protecting electrical appliances from voltage surges and providing a safe path for fault currents.<br><br>Answer: <b>True</b>                           | CO1         |
| 7.           | In a series circuit, if one component fails, the entire circuit stops functioning.<br><br>Answer: <b>True</b>  | CO1         |
| 8.           | In a parallel circuit, if one branch is disconnected, the remaining branches will still operate normally.<br><br>Answer: <b>True</b>   | CO1         |
| 9.           | The neutral wire carries the return current back to the source, completing the circuit.<br><br>Answer: <b>True</b>   | CO1         |
| 10.          | A circuit breaker is a device used to protect a circuit from damage caused by overcurrent or short circuit by automatically disconnecting the circuit when a fault is detected.<br><br>Answer: <b>True</b> | CO1         |
| 11.          | A fuse and a circuit breaker serve the same purpose, but a fuse can be reused after it blows.<br><br>Answer: <b>False</b>  | CO1         |
| 12.          | In a series circuit, the total resistance increases as more resistors are added.<br><br>Answer: <b>True</b>  | CO1         |
| 13.          | In a star connection of a three-phase system, the line voltage is greater than the phase voltage.<br><br>Answer: <b>True</b>   | CO1         |
| 14.          | A ceiling fan capacitor is used to improve the efficiency of the motor by providing a phase shift to the current.<br><br>Answer: <b>True</b>   | CO1         |

| 15.                        | In a household wiring system, the live wire is the wire that is directly connected to the power supply.<br><b>Answer: True</b>  | CO1             |                 |                            |   |                            |  |                  |                               |                  |                            |     |
|----------------------------|---|-----------------|-----------------|----------------------------|---|----------------------------|--|------------------|-------------------------------|------------------|----------------------------|-----|
| 16.                        | The power consumed by an electrical appliance is directly proportional to the current flowing through it and the voltage applied across it.<br><b>Answer: True</b>  | CO1             |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| 17.                        | In a short circuit, current flows through a path with very low resistance, potentially damaging the components of the circuit.<br><b>Answer: True</b>   | CO1             |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| 18.                        | In a staircase circuit, two-way switches are used to control the same load from two different locations.<br><b>Answer: True</b>   | CO1             |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| 19.                        | The earth wire in a domestic electrical system is primarily used for carrying current in normal operation.<br><b>Answer: False (The earth wire is used for safety, to carry fault current to the ground.)</b>   | CO1             |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| 20.                        | In a three-phase system, the line voltage is always equal to the phase voltage.<br><b>Answer: False</b>   | CO1             |                 |                            |   |                            |  |                  |                               |                  |                            |     |
|                            | <b>MATCH THE FOLLOWING</b>  | CO1             |                 |                            |   |                            |  |                  |                               |                  |                            |     |
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| <b>Column A</b>            | <b>Column B</b>   |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| A. Voltage                 | 1. Measure of potential difference  |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| B. Current                 | 2. Flow of electric charge  |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| C. Resistance              | 3. Opposition to current flow   |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| D. Power                   | 4. Rate of energy transfer  |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| 22.                        | <p><b>Kirchhoff's Laws</b></p> <table> <thead> <tr> <th><b>Column A</b></th> <th><b>Column B</b></th> </tr> </thead> <tbody> <tr> <td>A. Kirchhoff's Current Law</td> <td>1. Current entering a junction equals leaving current</td> </tr> <tr> <td>B. Kirchhoff's Voltage Law</td> <td>2. Sum of voltage in a closed loop is zero</td> </tr> <tr> <td>C. Node Analysis</td> <td>3. Based on KCL</td> </tr> <tr> <td>D. Loop Analysis</td> <td>4. Based on KVL</td> </tr> </tbody> </table> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 1, C - 4, D - 3</li> <li>3. A - 3, B - 4, C - 2, D - 1</li> <li>4. A - 4, B - 3, C - 1, D - 2</li> </ol> <b>Answer:</b> Option 1 | <b>Column A</b> | <b>Column B</b> | A. Kirchhoff's Current Law | 1. Current entering a junction equals leaving current | B. Kirchhoff's Voltage Law | 2. Sum of voltage in a closed loop is zero | C. Node Analysis | 3. Based on KCL               | D. Loop Analysis | 4. Based on KVL            | CO1 |
| <b>Column A</b>            | <b>Column B</b>   |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| A. Kirchhoff's Current Law | 1. Current entering a junction equals leaving current   |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| B. Kirchhoff's Voltage Law | 2. Sum of voltage in a closed loop is zero  |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| C. Node Analysis           | 3. Based on KCL   |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| D. Loop Analysis           | 4. Based on KVL   |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| 23.                        | <p><b>Series and Parallel Circuits</b></p> <table> <thead> <tr> <th><b>Column A</b></th> <th><b>Column B</b></th> </tr> </thead> <tbody> <tr> <td>A. Series Circuit</td> <td>1. Current is the same</td> </tr> <tr> <td>B. Parallel Circuit</td> <td>2. Voltage is the same</td> </tr> </tbody> </table>  | <b>Column A</b> | <b>Column B</b> | A. Series Circuit          | 1. Current is the same                                | B. Parallel Circuit        | 2. Voltage is the same                     | CO1              |                               |                  |                            |     |
| <b>Column A</b>            | <b>Column B</b>   |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| A. Series Circuit          | 1. Current is the same  |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |
| B. Parallel Circuit        | 2. Voltage is the same  |                 |                 |                            |   |                            |  |                  |                               |                  |                            |     |

|     |   |     |
|-----|---|-----|
|     | <p>C. Total Resistance (Series) 3. Sum of individual resistances<br/> D. Total Resistance (Parallel) 4. Reciprocal of sum of reciprocals</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 3, B - 4, C - 1, D - 2</li> <li>3. A - 2, B - 1, C - 4, D - 3</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 1</p>   |     |
| 24. | <p><b>Earthing and its Types</b></p> <p><b>Column A      Column B</b></p> <p>A. Pipe Earthing 1. GI pipe buried in the ground<br/> B. Plate Earthing 2. Metal plate in moist soil<br/> C. Strip Earthing 3. Metal strips for large installations<br/> D. Rod Earthing 4. Copper rod driven into the ground</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 4, C - 1, D - 3</li> <li>3. A - 3, B - 1, C - 4, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 1</p> | CO1 |
| 25. | <p><b>Basic House Wiring Components</b></p> <p><b>Column A      Column B</b></p> <p>A. Fuse 1. Overcurrent protection<br/> B. Switch 2. Circuit control<br/> C. Socket 3. Power outlet<br/> D. Conduit 4. Protective tubing</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 1, B - 2, C - 3, D - 4</li> <li>2. A - 2, B - 3, C - 4, D - 1</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 1, C - 2, D - 3</li> </ol> <p><b>Answer:</b> Option 1</p>  | CO1 |
| 26. | <p><b>Types of Wiring</b></p> <p><b>Column A      Column B</b></p> <p>A. Conduit Wiring 1. Encloses electrical wiring<br/> B. Casing and Capping 2. Uses wooden strips<br/> C. Batten Wiring 3. Uses wooden battens<br/> D. Cleat Wiring 4. Uses porcelain cleats</p> <p><b>Options:</b></p> <ol style="list-style-type: none"> <li>1. A - 2, B - 1, C - 4, D - 3</li> <li>2. A - 1, B - 2, C - 3, D - 4</li> <li>3. A - 3, B - 4, C - 1, D - 2</li> <li>4. A - 4, B - 3, C - 2, D - 1</li> </ol> <p><b>Answer:</b> Option 2</p>  | CO1 |
| 27. | <p><b>Safety Measures</b></p> <p><b>Column A      Column B</b></p> <p>A. Fuse 1. Prevents overcurrent damage</p>  | CO1 |



# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – SHORT QUESTIONS – SET A**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | <p>Define Ohm's Law and derive its expression in terms of resistance, voltage, and current.</p> <p><b>Answer:</b> Ohm's Law states that the current through a conductor is directly proportional to the voltage across it, provided the temperature remains constant. Its expression is <math>V=IR</math>, where V is voltage, I is current, and R is resistance.</p>  | CO1  |
| 2.    | <p>A resistor of <math>5\ \Omega</math> is connected to a 10 V power supply. Calculate the power dissipated in the resistor.</p> <p><b>Answer:</b> Power (<math>P</math>) = <math>V^2/R</math>. Substituting values: <math>P=10^2/5=20\ W</math>.</p>  | CO1  |
| 3.    | <p>State and explain Kirchhoff's Current Law (KCL) with an example.</p> <p><b>Answer:</b> KCL states that the sum of currents entering a junction equals the sum of currents leaving the junction. Example: If currents of 3 A, 2 A and 5 A enter a junction, the outgoing current must be <math>3+2+5=10</math></p>   | CO1  |
| 4.    | <p>Using Kirchhoff's Voltage Law (KVL), calculate the unknown voltage <math>V_x</math> in a circuit with a 12 V battery, resistances <math>4\ \Omega</math> and <math>2\ \Omega</math> and a current of 2 A.</p> <p><b>Answer:</b> KVL states <math>12=2(4)+V_x</math>. Solving: <math>V_x=12-8=4\ V</math>.</p>   | CO1  |
| 5.    | <p>Two resistors, <math>R_1=10\ \Omega</math> and <math>R_2=15\ \Omega</math> are connected in parallel. Determine the equivalent resistance and explain why the value is less than the smallest resistor.</p> <p><b>Answer:</b></p> $R_{eq} = \frac{R_1 R_2}{R_1 + R_2} = \frac{10 \cdot 15}{10 + 15} = 6\ \Omega$ <p>The equivalent resistance is less because parallel connections provide multiple paths for current flow.</p> | CO1  |
| 6.    | <p>A <math>10\ \Omega</math> resistor is added in parallel to a <math>20\ \Omega</math> resistor, and this combination is in series with a <math>5\ \Omega</math> resistor. Calculate the total resistance.</p> <p><b>Answer:</b> For parallel:</p> $R_p = \frac{10 \cdot 20}{10 + 20} = 6.67\ \Omega$ <p>Total resistance: <math>R_t=6.67+5=11.67\ \Omega</math>.</p>   | CO1  |
| 7.    | <p>If a metal casing of an appliance is not earthed, explain what could happen during a fault condition and propose a solution.</p> <p><b>Answer:</b> Without earthing, leakage current can pass through a person touching the appliance, causing electric shock. The solution is to provide proper earthing to direct the leakage current safely to the ground.</p>   | CO1  |
| 8.    | <p>Compare pipe earthing and plate earthing in terms of cost, maintenance, and efficiency. Which is better for industrial installations?</p> <p><b>Answer:</b> Pipe earthing is cheaper and easier to maintain, while plate earthing is more efficient and durable. Plate earthing is better for industrial installations due to its reliability and higher current-carrying capacity.</p>   | CO1  |
| 9.    | <p>Why is the neutral wire in a household circuit at a potential of 0 V? What would happen if it is disconnected?</p> <p><b>Answer:</b> The neutral wire is grounded, maintaining 0 V potential. If disconnected, appliances may malfunction or become hazardous due to floating voltage levels.</p>   | CO1  |

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|-----|---|-----|
| 10. | <p>Devise a wiring layout for a single room containing a ceiling fan, a light bulb, and a power socket, ensuring minimal wiring costs.</p> <p><b>Answer:</b> Connect the light and fan in parallel with separate switches for control. Place the socket on the same circuit but with an additional fuse for overload protection.</p>        | CO1 |
| 11. | <p>A technician uses a multimeter to measure resistance but notices fluctuations. Suggest possible causes and remedies.</p> <p><b>Answer:</b> Causes: Loose connections, unstable probe contact, or a faulty multimeter. Remedies: Secure connections, ensure stable contact, and check or replace the multimeter's battery.</p>            | CO1 |
| 12. | <p>Evaluate the safety and efficiency of using wire strippers versus using a knife to strip insulation.</p> <p><b>Answer:</b> Wire strippers are safer and more precise, reducing the risk of wire damage or injury. Knives are less safe and can easily damage wires or cause accidents.</p>   | CO1 |
| 13. | <p>Analyze the advantages and disadvantages of concealed wiring compared to surface wiring in a home.</p> <p><b>Answer:</b> Concealed wiring is safer and aesthetically pleasing but expensive and harder to repair. Surface wiring is cheaper and easier to maintain but less attractive and more prone to damage.</p>                     | CO1 |
| 14. | <p>Design a cost-effective wiring system for a three-story building, considering safety and future scalability.</p> <p><b>Answer:</b> Use conduit wiring with centralized distribution boards. Install separate circuits for each floor to ensure safety and allow future scalability.</p>  | CO1 |
| 15. | <p>A staircase lighting circuit has a problem where the light remains on regardless of the switch positions. Identify the fault and suggest a correction.</p> <p><b>Answer:</b> Fault: Misconnection of the two-way switch wiring. Correction: Reconnect the common and traveler wires as per the correct two-way switch configuration.</p> | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

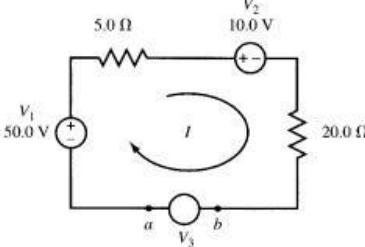
## **23ES1102- UNIT I – SHORT QUESTIONS – SET B**

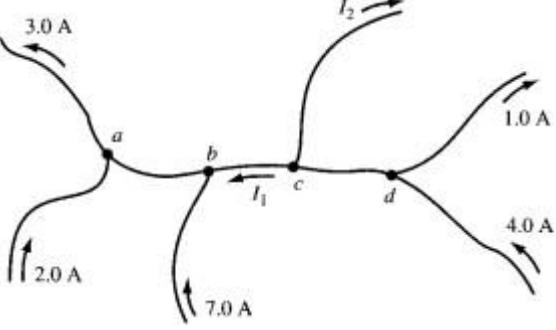
Year/Semester : I/II

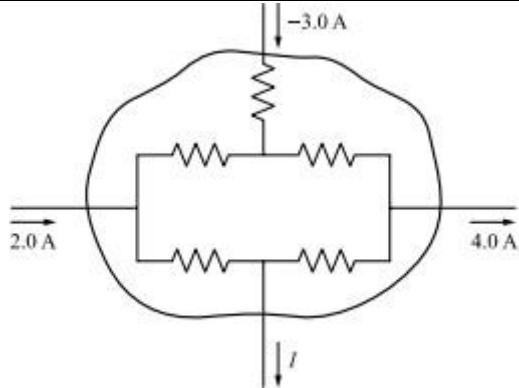
Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

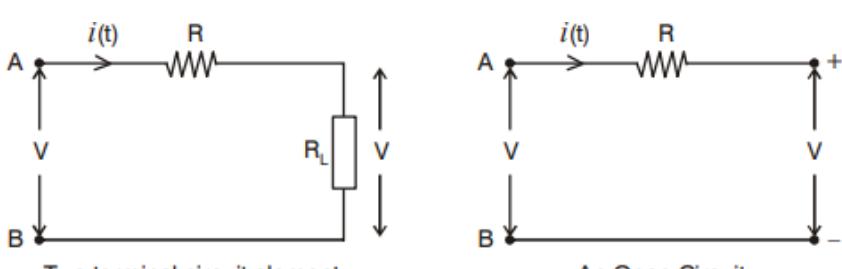
| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | <p><b>Define Ohm's Law and state its mathematical expression.</b><br/> <b>Answer:</b> Ohm's Law states that the current flowing through a conductor between two points is directly proportional to the voltage across the two points. Mathematically, it can be expressed as <math>V=I\times R</math>.</p>   | CO1  |
| 2.    | <p><b>What is meant by linear and non linear networks?</b></p> <p><b>Linear Network:</b> If circuit parameters are always constant irrespective of change in time, voltage and temperature is called Linear network.</p> <p><b>Non Linear Network:</b> A circuit whose parameters changes their values with change in time, voltage and temperature is called Non Linear Network.</p>  | CO1  |
| 3.    | <p><b>Find <math>V_3</math> and its polarity if the current <math>I</math> for the circuit shown is 0.40A.</b></p>  <p style="text-align: center;">Fig. 3-7</p> <p>Assume that <math>V_3</math> has the same polarity as <math>V_1</math>. Applying KVL and starting from the lower left corner,</p> $V_1 - I(5.0) - V_2 - I(20.0) + V_3 = 0$ $50.0 - 2.0 - 10.0 - 8.0 + V_3 = 0$ $V_3 = -30.0 \text{ V}$ <p>Terminal <math>b</math> is positive with respect to terminal <math>a</math>.</p> | CO1  |
| 4.    | <p><b>Why Kirchhoff's laws are important in circuit analysis?</b></p> <p><b>Answer:</b> These laws are important because they provide a systematic method for analyzing complex electrical circuits.</p>   | CO1  |
| 5.    | <p><b>Explain the concept of mesh current analysis.</b></p> <p><b>Answer:</b> Mesh current analysis is a method used to analyze electrical circuits by assigning currents to different loops (meshes) in the circuit.</p>  | CO1  |
| 6.    | <p><b>How does node voltage analysis differ from mesh current analysis?</b></p> <p><b>Answer:</b> Node voltage analysis involves analyzing a circuit by considering the voltages at various nodes (points where two or more elements connect). It applies Kirchhoff's Current Law at each node to set up equations for the unknown node voltages.</p>  | CO1  |

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| 7.  | <p><b>Obtain the currents <math>I_1</math> and <math>I_2</math> for the network shown below.</b></p>  <p><i>a</i> and <i>b</i> comprise one node. Applying KCL,<br/> <math display="block">2.0 + 7.0 + I_1 = 3.0 \quad \text{or} \quad I_1 = -6.0 \text{ A}</math></p> <p>Also, <i>c</i> and <i>d</i> comprise a single node. Thus,<br/> <math display="block">4.0 + 6.0 = I_2 + 1.0 \quad \text{or} \quad I_2 = 9.0 \text{ A}</math></p> | CO1 |
| 8.  | <p><b>What is meant by active and passive networks?</b></p> <p><b>Active Network :</b> A circuit which contains a source of energy is called Active Network.</p> <p><b>Example :</b> Voltage and Current sources</p> <p><b>Passive Network :</b> A circuit which has no energy source is called Passive Network</p> <p><b>Example :</b> Resistor (R), Inductor (L), Capacitors (C)</p>   | CO1 |
| 9.  | <p><b>Discuss the significance of Kirchhoff's Current Law in circuit analysis.</b></p> <p><b>Answer:</b> Kirchhoff's Current Law (KCL) is significant because it ensures that the conservation of charge is maintained in electrical circuits. It states that the algebraic sum of currents entering and leaving a node in a circuit is zero, which allows us to set up equations and solve for unknown currents in complex circuits.</p>  | CO1 |
| 10. | <p><b>Explain the concept of a node in electrical circuits.</b></p> <p><b>Answer:</b> A node in an electrical circuit is a point where two or more circuit elements are connected. It is a reference point for analyzing circuit voltages and currents.</p>  | CO1 |
| 11. | <p><b>How does the total resistance change when resistors are added in parallel?</b></p> <p><b>Answer:</b> When resistors are added in parallel, the total resistance decreases. This is because adding more parallel paths for the current to flow reduces the overall resistance to the flow of current.</p>   | CO1 |
| 12. | <p><b>How does Kirchhoff's Voltage Law help in analyzing electrical circuits?</b></p> <p><b>Answer:</b> Kirchhoff's Voltage Law (KVL) helps in analyzing electrical circuits by providing a systematic method for understanding and solving circuit problems. By applying KVL to different loops in a circuit, one can set up equations and solve for unknown voltages, currents, or other circuit parameters.</p>   | CO1 |
| 13. | <p><b>Find the current <math>I</math> for the circuit shown below.</b></p>   | CO1 |



The branch currents within the enclosed area cannot be calculated since no values of the resistors are given. However, KCL applies to the network taken as a single node. Thus,

$$2.0 - 3.0 - 4.0 - I = 0 \quad \text{or} \quad I = -5.0 \text{ A}$$

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| 14. | <b>What are the classifications of circuit elements?</b><br>The classification of circuit elements are <ul style="list-style-type: none"> <li>➤ Active Elements</li> <li>➤ Passive elements</li> <li>➤ Lumped and distributed elements</li> <li>➤ Bilateral and unilateral elements</li> <li>➤ Linear and non-linear elements</li> </ul> | CO1 |
| 15. | <b>What is meant by Open circuit?</b><br> <p>The current in an Open Circuit is always Zero, regardless of the voltage across it.<br/>         Mathematically, <math>i(t) = 0, V(t) \neq 0</math></p>   | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

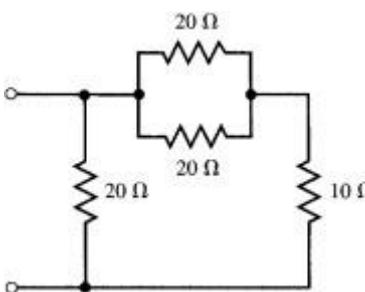
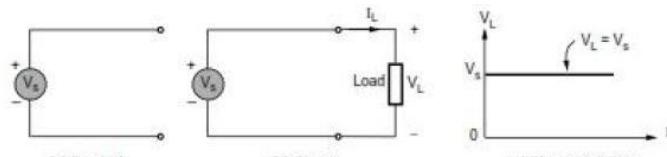
## **23ES1102- UNIT I – SHORT QUESTIONS – SET C**

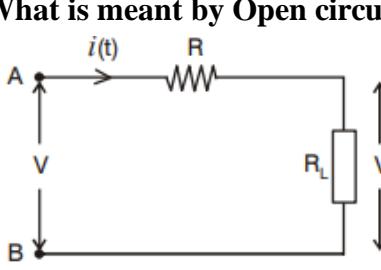
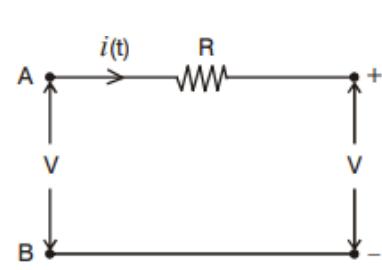
Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | <p><b>What are Dependent and independent sources?</b><br/> The electrical energy supplied by a dependent source depends on another source of electrical energy.<br/> The electrical energy supplied by an independent source does not depend on another electrical energy. They convert energy in some form to electrical energy.</p>  | CO1  |
| 2.    | <p><b>Find the equivalent resistance for the circuit shown below,</b></p>  <p>The two 20-Ω resistors in parallel have an equivalent resistance <math>R_{eq} = [(20)(20)/(20 + 20)] = 10 \Omega</math>. This is in series with the 10-Ω resistor so that their sum is 20 Ω. This in turn is in parallel with the other 20-Ω resistor so that the overall equivalent resistance is 10 Ω.</p> | CO1  |
| 3.    | <p><b>State Kirchoff's voltage law?</b><br/> Kirchoff's voltage law states that“The algebraic sum of the voltages around any closed path is zero”. <math>\sum V = 0</math>.</p>  | CO1  |
| 4.    | <p><b>Discuss the significance of mesh current analysis in circuit analysis.</b><br/> <b>Answer:</b> By assigning currents to different loops (meshes) in the circuit and applying Kirchhoff's Voltage Law to each mesh, one can set up and solve equations to determine the unknown currents flowing through each loop.</p>   | CO1  |
| 5.    | <p><b>Draw the V-I Characteristics of ideal voltage source.</b></p>    | CO1  |
| 6.    | <p><b>Describe the process of calculating total resistance in a parallel circuit.</b><br/> <b>Answer:</b>In a parallel circuit ,the reciprocal of the total resistance is equal to the sum of the reciprocals of the individual resistances.Mathematically, it can be expressed as <math>1/R_{total}=(1/R_1)+(1/R_2)+(1/R_3)+...</math></p>  | CO1  |
| 7.    | <p><b>Describe the procedure for solving a circuit using mesh current analysis.</b><br/> <b>Answer:</b>To solve a circuit using mesh current analysis, follow these steps:</p>   | CO1  |

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|-----|---|-----|
|     | <p>1. Identify the meshes (loops) in the circuit.<br/>     2. Assign a clockwise or counterclockwise mesh current to each mesh.<br/>     3. Apply Kirchhoff's Voltage Law to each mesh to set up equations.<br/>     4. Solve the equations to find the unknown mesh currents.</p> <p>Use the mesh currents to find other quantities of interest, such as voltages or powers.</p>   |     |
| 8.  | <p><b>What is difference between Loop and Mesh?</b><br/>     A loop is any closed path of network. A mesh is most elementary form of the loop and cannot be further divided into other loops.</p>   | CO1 |
| 9.  | <p>Anelectricheaterdraws8Afrom250Vsupply.What is its power rating? Also find the resistance of the heater element</p> <p>Power rating, <math>P = V \cdot I \times \cos\phi</math></p> $= 250 \times 8 \times 1$ <p><b>P = 2000 watts</b></p> <p>Resistance (<math>R</math>) = <math>\frac{V}{I}</math></p> $R = \frac{250}{8}$ <p><b>R = 31.25 Ω</b></p> <p>(<math>\because \phi = 0, \cos \phi = 1</math>)</p>                         | CO1 |
| 10. | <p>A resistor with a current of 3A through it converts 500 J of electrical energy into heat energy in 12 sec. What is the voltage across the resistor?</p> <p>Energy = <math>V \cdot I \cdot t</math>.</p> $\frac{3A}{R} \therefore V = \frac{500}{3 \times 12}$ $500 = V \times 3 \times 12$ <p><b>V = 13.88 volts</b></p>   | CO1 |
| 11. | <p><b>What are the classifications of circuit elements?</b><br/>     The classification of circuit elements are</p> <ul style="list-style-type: none"> <li>➤ Active Elements</li> <li>➤ Passive elements</li> <li>➤ Lumped and distributed elements</li> <li>➤ Bilateral and unilateral elements</li> <li>➤ Linear and nonlinear elements</li> </ul>  | CO1 |
| 12. | <p><b>What is meant by Open circuit?</b></p>  <p>Two terminal circuit element</p>  <p>An Open Circuit</p> <p>The current in an Open Circuit is always Zero, regardless of the voltage across it.<br/>     Mathematically, <math>i(t) = 0, V(t) \neq 0</math></p> | CO1 |

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|-----|--|-----|
| 13. | <b>Explain the concept of earthing and describe how plate earthing is implemented.</b><br><b>Answer:</b> Earthing is connecting the metallic parts of electrical systems to the ground to prevent electric shock. Plate earthing uses a copper or GI plate buried in the ground with charcoal and salt around it, connected to the equipment through a wire. | CO1 |
| 14. | <b>Compare the safety implications of fuse-based protection versus circuit breakers in household wiring.</b><br><b>Answer:</b> Fuses are simple and cheap but require replacement after a fault, while circuit breakers are reusable and provide quicker, more reliable protection. Circuit breakers are safer for modern installations.                     | CO1 |
| 15. | <b>Analyze why a neutral wire is necessary in a single-phase supply system.</b><br><b>Answer:</b> The neutral wire provides a return path for current, ensuring a complete circuit. It maintains voltage stability and safety by keeping the system grounded.  | CO1 |

## **Department of EEE**

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – SHORT QUESTIONS – SET D**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks : 30

|     |   |     |
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| 8.  | <b>Analyze why a neutral wire is necessary in a single-phase supply system.</b><br><b>Answer:</b> The neutral wire provides a return path for current, ensuring a complete circuit. It maintains voltage stability and safety by keeping the system grounded.   | CO1 |
| 9.  | <b>In a basic house wiring system, how would you ensure that a single fault does not disable the entire system?</b><br><b>Answer:</b> Use a distribution board with separate circuits for lights, sockets, and appliances. Install circuit breakers for each circuit to isolate faults without affecting the entire system. | CO1 |
| 10. | <b>A multimeter shows fluctuating readings while measuring voltage. What could be the possible reasons and how would you fix them?</b><br><b>Answer:</b> Possible reasons: loose connections, unstable probes, or a faulty meter. Fix: Tighten connections, ensure probe stability, and check or replace the multimeter.    | CO1 |
| 11. | <b>Identify and describe two main types of wiring systems used in households.</b><br><b>Answer:</b> Concealed wiring: Cables are hidden in walls, aesthetically pleasing and safe but costly. Surface wiring: Cables are visible, cheaper, and easier to install but less attractive.                                       | CO1 |
| 12. | <b>Explain the safety precautions required while performing staircase wiring.</b><br><b>Answer:</b> Ensure power is off before starting, use insulated tools, double-check connections of two-way switches, and test the circuit thoroughly after installation.   | CO1 |
| 13. | <b>Compare the efficiency and durability of aluminum wiring with copper wiring.</b><br><b>Answer:</b> Copper wiring is more efficient, durable, and has higher conductivity than aluminum wiring. However, aluminum is cheaper and lighter but prone to corrosion and higher resistance.                                    | CO1 |
| 14. | <b>How would you troubleshoot a ceiling fan that does not start but hums when powered on?</b><br><b>Answer:</b> Likely causes: a faulty capacitor or jammed motor bearings. Fix: Replace the capacitor or lubricate the motor bearings.   | CO1 |
| 15. | <b>Explain the working of a two-way switch system used in staircase wiring.</b><br><b>Answer:</b> Two-way switches control a single light from two locations. Each switch has three terminals: common, L1, and L2. The switches alternate connections to complete or break the circuit for the light.                       | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

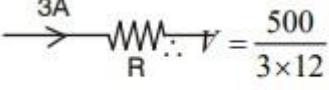
## **23ES1102- UNIT I – SHORT QUESTIONS – SET E**

Year/Semester : I/II

Max Time : 30 Mins

Regulation : 2023

Max Marks :  $15 \times 2 = 30$

| SL.NO | QUESTIONS   | CO'S |
|-------|---|------|
| 1.    | <p><b>A electric heater draws 8A from 250V supply. What is its power rating? Also find the resistance of the heater element</b></p> <p>Power rating, <math>P = V.I \times \cos\phi</math></p> $= 250 \times 8 \times 1$ <p><b>P = 2000 watts</b></p> <p>(<math>\because \phi = 0, \cos \phi = 1</math>)</p> <p>Resistance (<math>R</math>) = <math>\frac{V}{I}</math></p> $R = \frac{250}{8}$ <p><b>R = 31.25 Ω</b></p> | CO1  |
| 2.    | <p><b>A resistor with a current of 3A through it converts 500 J of electrical energy into heat energy in 12 sec. What is the voltage across the resistor?</b></p> <p>Energy = <math>V.I.t</math>.</p>  $500 = V \times 3 \times 12$ <p><b>V = 13.88 volts</b></p>  | CO1  |
| 3.    | <p><b>A multimeter shows fluctuating readings while measuring voltage. What could be the possible reasons and how would you fix them?</b></p> <p><b>Answer:</b> Possible reasons: loose connections, unstable probes, or a faulty meter.</p> <p><b>Fix:</b> Tighten connections, ensure probe stability, and check or replace the multimeter.</p>   | CO1  |
| 4.    | <p><b>Identify and describe two main types of wiring systems used in households.</b></p> <p><b>Answer:</b> Concealed wiring: Cables are hidden in walls, aesthetically pleasing and safe but costly. Surface wiring: Cables are visible, cheaper, and easier to install but less attractive.</p>  | CO1  |
| 5.    | <p><b>Explain the working of staircase wiring and its practical application.</b></p> <p><b>Answer:</b> Staircase wiring uses two-way switches to control a light from two locations. It is used in multi-level homes and staircases for convenience and safety.</p>   | CO1  |
| 6.    | <p><b>Compare the applications of ring earthing and pipe earthing.</b></p> <p><b>Answer:</b> Ring earthing is used in areas with a high water table for better conductivity, while pipe earthing is common in dry areas for economical and efficient grounding.</p>   | CO1  |
| 7.    | <p><b>Why is the live wire insulated, and what could happen if the insulation is damaged?</b></p> <p><b>Answer:</b> The live wire is insulated to prevent accidental contact that can cause electric shock. Damaged insulation can lead to short circuits, fires, or shocks.</p>  | CO1  |
| 8.    | <p><b>Propose a basic house wiring plan for a two-room house including switches, sockets, and lights.</b></p> <p><b>Answer:</b> Use separate circuits for lighting and sockets. Place switches near doors for convenience, install at least two sockets per room, and use parallel wiring for lights and appliances.</p>  | CO1  |

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| 9.  | <p><b>A wire stripper damages the core of a wire during use. What could be the cause, and how can it be avoided?</b></p> <p><b>Answer:</b> Cause: Incorrect size of the stripper's blade or improper handling.<br/>Avoidance: Use a properly sized stripper and follow the tool's guidelines.</p>  | CO1 |
| 10. | <p><b>Describe the process of calculating total resistance in a parallel circuit.</b></p> <p><b>Answer:</b> In a parallel circuit, the reciprocal of the total resistance is equal to the sum of the reciprocals of the individual resistances. Mathematically, it can be expressed as <math>\frac{1}{R_{\text{total}}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots</math></p>   | CO1 |
| 11. | <p><b>Describe the procedure for solving a circuit using mesh current analysis.</b></p> <p><b>Answer:</b> To solve a circuit using mesh current analysis, follow these steps:</p> <ol style="list-style-type: none"> <li>5. Identify the meshes (loops) in the circuit.</li> <li>6. Assign a clockwise or counterclockwise mesh current to each mesh.</li> <li>7. Apply Kirchhoff's Voltage Law to each mesh to set up equations.</li> <li>8. Solve the equations to find the unknown mesh currents.</li> </ol> <p>Use the mesh currents to find other quantities of interest, such as voltages or powers.</p> | CO1 |
| 12. | <p><b>State Kirchhoff's Voltage Law (KVL) and explain its application in a series circuit with an example.</b></p> <p><b>Answer:</b> KVL states that the algebraic sum of all voltages in a closed loop is zero. In a series circuit with a 10 V battery and resistors <math>2 \Omega</math> and <math>3 \Omega</math>, KVL gives <math>10 - 2I - 3I = 0</math>, solving for <math>I</math>.</p>   | CO1 |
| 13. | <p><b>Identify and describe two main types of wiring systems used in households.</b></p> <p><b>Answer:</b> Concealed wiring: Cables are hidden in walls, aesthetically pleasing and safe but costly. Surface wiring: Cables are visible, cheaper, and easier to install but less attractive.</p>   | CO1 |
| 14. | <p><b>Explain the safety precautions required while performing staircase wiring.</b></p> <p><b>Answer:</b> Ensure power is off before starting, use insulated tools, double-check connections of two-way switches, and test the circuit thoroughly after installation.</p>   | CO1 |
| 15. | <p><b>Compare the efficiency and durability of aluminum wiring with copper wiring.</b></p> <p><b>Answer:</b> Copper wiring is more efficient, durable, and has higher conductivity than aluminum wiring. However, aluminum is cheaper and lighter but prone to corrosion and higher resistance.</p>  | CO1 |

# Department of EEE

**Course Code / Course Name: 23ES1102 /BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

## **23ES1102- UNIT I – ASSIGNMENT QUESTIONS**

Year/Semester : I/II

Regulation : 2023

Max Marks : 50

| SL.NO | QUESTIONS  | CO'S |
|-------|--|------|
| 1.    | <p>(a)Find all branch currents for the network shown below.</p> <p>(b)Determine the current delivered by the source for the circuit shown</p>  | CO1  |
| 2.    | <p>(a)Three loads A,B and C are connected in parallel to a 240V source. Load A takes 9.6 kW, Load B takes 60 A and Load C has a resistance of 4.8Ω.Calculate individual load resistances and equivalent resistance. Also find the total current and power delivered from source.</p> <p>(b)In the circuit shown in figure, find the different mesh currents, and the current through <math>R_L</math>.</p> | CO1  |
| 3.    | Explain the different types of wiring systems used in residential houses.  | CO1  |
| 4.    | List and explain safety measures that should be followed during electrical wiring installation in homes.   | CO1  |
| 5.    | Explain the concept of staircase wiring. How does it allow controlling a light from two different locations?   | CO1  |

