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Topic: Electronics Workshop

1) What are 5 electrical safety tips?

The following are 5 electrical safety tips:

- ① A spoiled wise of an instrument must necessarily be replaced.
- ② Broken easily of switches and plugs should be immediately used.
- ③ Earth all metallic parts.
- ④ Always use a pin instead of inserting bare wires.
- ⑤ Never connect more than 1 lamp on one point.

2) What are the safety precautions of house wiring?

The safety precautions of house wiring are as follows:

- ① Get all possible informations and instructions from your superiors and they should be understood carefully.
- ② Get all instruments and equipments related to your job at once.
- ③ As far as possible, switch on the mains.
- ④ If the job requires that you must take care, then use rubber shoes and hand gloves.
- ⑤ While working on running equipments, first check test lamp that all metallic parts are earthed.
- ⑥ Flexible wires can be used in equipment.
- ⑦ Make sure to mark wires with appropriate carrying capacity.
- ⑧ A switch must be connected to wire on the live wire.
- ⑨ Use ISI (Indian Standard Institution) marked wires, switch, plug set.
- ⑩ Strictly follow all the rules of "Guide for safety"

procedure and practices!"

### 3] What are examples of electrical hazards?

→ The examples of electrical hazards are as follows:

- ① Poor wiring and defective electric wires.
- ② Outlets close to water.
- ③ Lightbulbs.
- ④ Covered electrical cords and wires.
- ⑤ Pouring water on electrical fire.
- ⑥ Inquisitive young children.
- ⑦ Wet hands.
- ⑧ Extension cords.

### 4] Do's and don'ts electrical safety?

Do's	Don'ts
① Check wires to make sure insulation is in good condition.	① One should not overload motors, circuits or outlets.
② Check electrical components connections to make sure they are tight	② One should not run cords, wires along the floor.
③ Read manufacturer's instructions for safety.	③ One should not use temporary wiring.
④ Check electrical equipment before each use	④ One should not touch anything electrical with wet hands.

5] What is color code of  $333k\Omega \pm 5\%$  five band resistor?

The color code of  $333k\Omega \pm 5\%$  five band resistor is  
Orange Orange Orange Orange Gold

6] In a 6 band color code, what does 6<sup>th</sup> band represent?

In a 6 band color code, the 6<sup>th</sup> band represents the temperature coefficient (ppm/K).

The most common color for 6<sup>th</sup> band is brown (100 ppm/K).

7] What is the tolerance value for a grey color in the tolerance band?

The tolerance value for grey color in the tolerance band is  $\pm 0.05\%$  for 4 band resistor, 5 band resistor and 6 band resistor.

8] What is the color code for a  $5k\Omega$ , tolerance  $\pm 5\%$  resistor?

The color code for  $5k\Omega$  with tolerance of  $\pm 5\%$  resistor is  
Green Black Orange Gold

9] What is the tolerance of a 3 band resistor?

There is no fourth tolerance band in 3 band resistor.  
The default tolerance is taken to be 20%.

10] What are the types of DC power supply?

The types of DC power supply are as follows:

① Two wire system

It has two wires namely positive and negative between two wires, the supply voltage varies between 220-250.

② Three wire system

It has 3 wire supply ~~not~~ namely, the positive, negative and the neutral. 460V are available between  $v^+$  and  $v^-$  while 230V are available between the neutral.

iii) what is different between AC and DC supply?

AC Supply

- ① AC supply is a flow of charge that exhibits a periodic change in direction.
- ② AC can be used/produced using a device called an alternator.
- ③ The AC supply is commonly used in homes.
- ④ Alternators create AC power by spinning wire loop inside magnetic field

DC Supply

- ① DC supply is a linear electric current, it moves in a straight line
- ② DC can be used/produced using rectifier which converts AC to DC
- ③ The DC supply is used in car outlets.
- ④ DC supply can come from multiple sources including batteries, etc

12) Why is AC dangerous than DC?

- ① AC is the current which changes its magnitude and direction periodically with time. While, DC is the current which has a magnitude and flows in one direction only.

- ② AC current is said to be more dangerous than DC current because the root mean squared value of AC is more than its original value. Also, the AC current can have a direct impact on our heart.
- ③ Our heart is driven by electric pulses the high electric frequency of AC can off the frequency of heart and lead to heart attack.
- ④ Thus, AC is dangerous than DC supply.

13] Which is better AC or DC? Explain with example.

- ① Alternating current is cheaper to generate and has fewer energy losses than direct current when transmitting over long distances.
- ② Although for very long distances (more than 1000 km), direct current can be ten times better.
- ③ Also, DC supply is significantly more energy efficient than AC power.
- ④ For eg. a) DC motors and appliances have higher efficiency and power to size characteristics.  
b) DC based lighting (LED) is as much as 75% more efficient than incandescent lighting.

14] Why DC is not used in homes?

- ① Direct current is not used at home because for the same value of voltage, DC is lethal than AC since DC does not go through zero.
- ② Electrolytic corrosion is more of an issue with direct current.

- ③ DC inductors are more complicated.
- ④ It requires commutators, electronic switches and brushes.

15] Which is cheaper AC or DC?

- ① AC is cheaper than DC
- ② DC is the current which starts from one point and flows through destination. It doesn't split.
- ③ Whereas AC is the type of current which splits (i.e. it distributes)
- ④ Therefore, due to low maintenance charges, AC is cheaper.

16] What is the difference between single phase and 3 phase wiring?

#### Single Phase Wiring

- ① Single phase wiring simultaneously changes supply voltage of AC
- ② It is generally known as residential voltage.
- ③ The common voltage for it is 230V.
- ④ It only requires 2 wires namely phase and neutral.

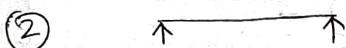
#### 3 Phase Wiring

- ① 3 phase wiring provides 3 AC with 3 separate services.
- ② 3 phase wiring remains to be constant.
- ③ The common voltage for it is 415V.
- ④ It requires three wires including conductor wires and neutral wires.

17] Draw graphical symbol mention in write up.



General wiring



Wiring on surface



Wiring going upwards

Distribution fuse box  
without switch

18] What are the rules for series and parallel circuits?

→ Rules for series circuit:

- ① Voltage drop add to equal total voltage.
- ② All components share same (equal) current.
- ③ Resistances add to equal resistance.

Rules for parallel circuit:

- ① All components share same (equal) voltage.
- ② Branch currents add to equal total current.
- ③ Resistances diminish to equal total resistance.

19] Can series and parallel circuits combine?

- ① When all devices are connected in series that it is called series combination.
- ② When all devices are connected in parallel it is called parallel combination.
- ③ A third type of circuit involves dual use of series and parallel connection in a circuit.
- ④ It is known as combination circuit.

20) What is an example of an open circuit?

If the circuit is not closed and there is a break in anywhere in loop, the current cannot flow, creating an open circuit condition.

For eg: Let a bulb get charged with a battery through a switch. When the switch is open it will break the path. It means the current cannot flow in this condition. And this is an open circuit condition.

21] What can cause an open circuit?

- ① Broken wire
- ② Poor connection
- ③ Loose terminal
- ④ Blown fuse
- ⑤ Tripped circuit breaker
- ⑥ Faulty switch
- ⑦ Blown Globe.

22) What is the difference between open & and closed circuit?

- | Open Circuit  | Closed Circuit  |
|---|---|
| <ul style="list-style-type: none"> <li>① It is not closed and not in continuous path</li> <li>② Electric current doesn't flow in here.</li> <li>③ The key in open circuit is represented as ()</li> </ul> | <ul style="list-style-type: none"> <li>① It is in closed and continuous path.</li> <li>② Electric current flows in closed circuit</li> <li>③ The key in closed circuit is represented as (•)</li> </ul> |

④ It is basically an incomplete circuit

④ It is basically a complete circuit.

23] How do you test for an open circuit?

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- ① The open circuit test or no-load test is one of the methods used to determine no-load impedance in excitation of transformer.
- ② The no-load is represented by the open circuit, which is represented on right side by the on right side of fig as "hole" or incomplete part of circuit.
- ③ An open circuit is one that discontinuous at point preventing electricity from flowing through it.
- ④ One can test for an open circuit by testing the continuity of the circuit using multimeter.

24] How can you tell if a PCB is positive or negative?

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- ① A properly designed PCB should have some markings that indicate capacitor polarity: a "+" on the silk screen, or maybe a square pad for the positive lead.
- ② A polarized capacitor should be marked in same way: "+" in ink, or a wimp in one end.

25] What is PCB? How many types of PCB? Explain.

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- PCB stands for "Printed Circuit Board". A PCB is a thin board made of fibre glass composite epoxy, or other laminate material. PCB's are used in both

desktop and laptop computers. They serve as the foundation for many internal computers. ~~They~~ serve components such as video cards, controller cards.

These components all connect to the mother board which is also a printed circuit board.

There are several types of PCB:

① Single layer PCB:

It is made up of a single layer, base material is coated with thin layer of metal copper.

② Double layer PCB:

It has a base material with a thin layer of conductive metal like copper applied to both sides of board.

③ Multilayer PCB:

It consists of series of three or more double layered PCB's. They are beneficial for data storage, GPS, etc.

④ Rigid PCB:

In addition to have different no. of layers, PCB can also come in changing flexibilities i.e. rigid PCB

⑤ Flex PCB:

This fundamental material permits board to fit into forms that inflexible cannot and to turn to or shift during use without harmful the circuit on PCB.

⑥ Rigid Flex Board:

It is made by comprising rigid circuit board joining flex circuit board.