ELECTRICAL TECHINICIAN ALL SHORT ANSWER QUESTIONS AND ANSWERS

1) What is current?

A) The flow of electric charges constitutes an electric current or simply current.

2) Define conductor , semi-conductor and insulator with examples.

→conductor : materials that conduct electricity are called conductors.eg:-silver, copper, aluminium etc.,

→semiconductor: material which behave both as conductor and also insulators at different temperature. Eg:- silicon and germanium

→Insulator: materials which conduct almost no electricity are called insulators.

3) What do you understand by electric potential.

→The electric potential is defined as the capability of the charged body to do work.

4) What is a specific resistance?

→Specific resistance of a material is the resistance between the opposite faces of 1-cm cube of the material.

5) Explain temperature co-efficient of resistance.

→It is defined as the increase in resistance per ohm of original resistance per degree centigrade rise in the temperature.

6) Define kirchaff's laws.

→It states that in any network of wires carrying currents the algebraic sum of the currents meeting at junction is zero.

7) What is a circuit?

→A circuit is that which allows a current to pass through it. It consists of a number of branches.

8) What is capacitor? Write its applications.

→A capacitor is a device which stores an electrical charge in it and it is widely used in electronic circuits.

9) What is a junction?

→Junction is that point where different paths of current meet.

10) Define work and write its units.

→Electrical work is said to be done in an electric circuit when, Q ampere-second of electricity passes through a circuit against a potential difference of V volt. Uint is joul or volt.

11) Define power and write its units.

→Electric power is the rate at which work is done in an electric circuit. Units are watts.

12) Define energy and write its untis.

→The total amount of work done in an electric circuit is called electrical energy.

13) How to convert H.P. into watts?

→1 H.P. = 735.5 watts or 745.5 watts

14) Give the names of 10 domestic appliances.

→Electric iron,fan,lamp etc.,

15) State Joules law

→According to joules law , the heat produced in a current carrying conductor is directly proportional to the square of the current and to the resistance of the conductor and to the time of flow of current.

16) Give the names of 5 electrical appliances where heating effect is utilized.

→Incandescent lamp, fluorescent lamp, Electric Kettle, Electric cooker and Electric Iron

17) What is heating effect of electric current?

→The electrical energy supplied to the conductor to overcome the 'electrical friction' is converted into heat. This is known as heating effect of electric current.

18) Name the parts of an electric iron

→Power cord , sleeve , handle , top cover , heel plate , pressure plate , asbestos , heating element , sole plate

19) What is a magnet?

→The substance which attracts magnetic materials is called a magnet.

20) Define pole and pole strength

→The strongest part of the magnet near the ends are called Pole. The power of the magnet to attract or repel is called pole strength of the magnet.

21) State the properties of magnet.

→The magnet always attracts magnetic substances.

→The magnet as two poles north and south pole.

→Like poles repel and unlike pole attract each other

→A magnet losses its magnetic properties when it is heated.

22) Describe magnetic field.

→The imaginary lines around the magnetic substance formed from north pole to south pole outside of bar magnet is called magnetic field.

23) Define flux density.

→It is the flux lines per cross sectional area normal to the flux lines. It is denoted by B.

24) Draw the magnetic field pattern of a bar magnet.

→draw

25) Draw the magnetic field pattern of a horse show magnet.

26) Define magnetic axis.

→An imaginary lines passing through magnetic north and south pole of a bar magnet is called Magnetic axis.

27) Write the names of the appliances using magnetic effect of electric current.

→Electric bells , signals , Indicators etc.,

28) What is a magnetic circuit?

→Magnetic circuit is the path followed by magnetic flux.

29) What do you understand by dynamically induced emf?

→Whenever a current carrying conductor rotates in a magnetic field , an emf is induced inside the conductor is called dynamically induced emf or faraday's law's of electromagnetic induction.

30) Define self induced emf

→It is defined as the emf induced in the coil due to increase or decrease of the current in the same coil

31) What is Inductance?

→Inductance is defined as the property of the coil due to which it opposes the change of current in the coil. This is due to lenz's law.

32) What is self induction?

→Self induction is the phenomenon by which an alternating emf is induced in a coil when an alternating current flows, through that coil.

33) Give the equation of energy stored in magnetic field?

→Energy stored = ½ LI^2 joules

34) Write the formula for lifting power of a magnet?

→$F=B^2A/9.81 \times 2u$

35) Write the expression for induced emf in a coil?

→e=-Ndpi/dt

36) What is lenz's law?

→An induced current is always flows in such a direction that it opposes the very cause production .

37) What is Induction?

→The process of producing an alternating emf in an coil is called induction.

38) Classify the induced emf's.

→Dynamic a> conductor rotates b> flux rotates

→Statically induced emf a>Self b> Mutual

39) Define cell

→A cell means a container, which contains some chemical substance having two terminals anode and cathode. A wire is connected externally , an electric current is passed through this wire.

40) What are the two efficiencies of a cell

→Energy efficiency and Quantity efficiency

41) What is a battery?

→The combinations of cells is called battery.

42) What are the components of a cell?

→Glass container

→Copper plate (+ve) Anode

→Zinc plate (-ve) Cathode

→Dilute sulphuric Acid.

43) What is chemical effect of electric current

→Whenever an electric current flows through some liquid or solution or water, the current reacts with that solution and the solution or water is de-composed into its constituents. This effect of electric current is called the chemical effects of electric current.

44) What is positive and negative charge?

→The deficiency of electrons is the positive charge.

→Excess of electrons is called Negative charge.

45) Define dielectric strength.

→

46) List various capacitors?

→Fixed Capacitors (Electrolyte capacitors and dry capacitors)

→Variable capacitors eg:- Air ,Glass ,Ceramic , plastic etc.

47) What are the uses of capacitors?

→Variable capacitors are used in electronic circuits.

48) What is charge and state units of charge?

→It may be defined as that charge which when placed in air at a distance of one meter from an equal and similar charge is repelled with a force of $9x10^9$ newtons.

49) What is an atom?

→All matter whether solid ,liquid or gas , is made up of a minute particles called molecule which can be further be sub-divided into atoms.

50) Define Atomic number.

→An atom is identified by its atomic number which indicates the number of protons in the nucleus.

51) Name the types of atomic bonds.

→Metallic bond

→Covalent bond

→Ionic bond

52) How electrical engineering materials are classified?

→Conductors , semi conductors and Insulators

53) What is valence electrons?

→The electrons in the outermost incomplete orbit called valence orbit or the valence ring are called the valence electrons.

54) How does temperature effect the resistivity of an alloy?

➔ Temperature coefficient of resistance should be low.

55) State the advantages of ACSR.

→High mechanical strength due to central steel wire.

→Long spans are possible.

→Reduces the number of poles and other equipment.

→No skin effect.

→Longer life is possible

→Cost is less

56) Give the applications of Copper and Aluminium.
→Copper is used for wires , cables , windings of generators and transformers , Overhead conductors and busbars.
→Aluminium is used for transmission and distribution of electrical energy .
57) What is semiconductors.
→A semi conductor is neither a good conductor nor a good insulator. It is a solid crystalline material whose electrical conductivity is intermediate between that of a conductor and an insulator.
58) What are the applications of semiconducting material
→They are used in telecommunications and radio communications.
59) What are the electrical properties of insulating materials?
→Insulation Resistance , Volume Resistance and Surface Resistance
60) How are the insulating materials classified?
→Solid Insulating materials , Liquid Insulating materials and Gaseous Insulating materials
61) What is dielectric strength
→The minimum voltage which when applied to an insulating material will result in the destruction of its insulating properties is called dielectric strength.
62) Name the mineral insulating liquids and uses.
→Alcohols , kerosine oil , lubricating oils , asphalts waxes and insulating oils . These oils are used in transformers , cables and capacitors.
63) Name the synthetic liquids and uses.
→Askarerls , pyranols , savol ,savotol. Stainless steel vessels and pipe lines are used for handling these liquids.
64) What is dielectric materials?
→Material which is an insulator and in which an electric field can be sustained with a minimum dissipation of power.
65) Explain dielectric strength.
→The maximum voltage that the dielectric can withstand without rupture is called dielectric strength.
66) What is polarization?
→Dielectric is introduced between the two charged capacitor plates, it will be noticed that the intensity of the electric field is developed and the potential difference between the two plates gets reduced. This effect is called polarization.
67) Name different protective materials.
→Lead , paints , steel tapes , varnishes bitumens etc.
68) What is dielectric loss?
→The loss appearing in the form of heat due to reversal of electric stresses compelling molecular rearrangement is known as Dielectric loss.
69) Write any two applications of dielectrics.
→Capacitors using vacuum , air or gases as dielectrics
→Capacitors using mineral oil as dielectric

70) What is thermocouple materials?
→When two different materials are joined at their ends , and the junction ends maintained at different temperatures to produce thermo-emf. These are called thermocouple materials.
71) What are the uses of Bi-metals?
→Bimetal strips are used in electrical apparatus and devices as relays and regulators.
72) What is soldering materials?
→Solder is the name given to several different alloys used for making a joints between pieces of metal.
73) What is fuse?
→A fuse is a protective device which consists of a thin wire or strip which melts when a predetermined value of current flowing through it is exceeded.
74) What is switch?
→A switch is an electrical device used to make or break an electrical circuit.
75) State different types of switches?
→One way switch , Two way switch and Two –way center off switch
76) What is the function of D.P ?
➔ Double pole main switches ,which can be operated simultaneously ,the switches are connected by a hand distribution boards of every house wiring.
77) Define fuse?
→A fuse is a simplest current interrupting device for protecting against excessive current.
78) What are the materials used for fuse element?
→The most commonly used materials for fuse elements are lead , zinc , tin and copper.
79) Classify the fuses?
→Open fuses(LV&HV)
→Semi-enclosed
→Cartridge or HRC fuses
→Liquid fuses
80) Expand a)SPST b) DPST c) DPDT d) DPIC e) SPT
81) List the various types of screw driver.
→Insulated screw driver , Torque screw driver , Flathead screw driver ,Tri-wing screw driver and Hex screw driver etc.
82) List the various types of pliers.
→Side cutting pliers , Nose plier , Diagonal cutting plier and Slip joint pliers.
83) What are the tools needed for an Electrician.
→Voltage tester , Wire stripper , cutting plier , Screw driver etc.,
84) What are the types of energy distribution systems?
→Distribution board system , the tree system and the loop –in-system.
85) How many types of wiring systems are there?
→Cleat wiring system
→PVC/Wooden casing capping
→CTS/TRS wiring
→Conduit wiring (Surface and concealed type)

86) Draw the wiring diagram of a fluorescent tube.
87) Draw the circuit diagram to control one lamp from two different places (stair case wiring).
88) Draw the simple lamp circuit.
89) What is the necessity of earthing ?
→The very purpose of earthing is to safe against dangers of shock and fire.
90) What are the types of earthing?
➔ A) Pipe earthing B) Plate earthing
91) How to measure earth resistance?
→Earth resistance can be measured by Earth tester or Megger.
92) What are the factors effecting earth resistance?
93) List the points to be earthened?
→Refrigerators , air cooler , heater , geyser , electric iron etc.,
94) State the least two reasons for not using fuse in neutral?
→If it is connected to neutral wire , the fuse will melt when excess current flow .
→If the person touches the appliance , he will receive the shock.
95) On what factors the earth resistance depend?
➔ Soil condition , Moisture , Dissolved salts , Climate condition , Physical composition etc.,
96) What are the effects of electric shock?
→Their may be fatal paralysis of heart.
→There may be sudden stoppage of breathing due to paralysis of muscles used in breathing.
→The heart may continue to beat , the face appears blue.
→Their may be burns etc.,
97) What is meant by an electric shock?
→ Electric shock is a jarring , shaking sensation resulting from contact with electric circuits or from the effects of lighting.

98) State three factors on which the severity of shock depends?
99) Define fundamental units and derived units.
→The unit of physical quantity , which is independent of any other quantites, is called a fundamental quantity.
→The units of physical quantites, which can be expressed in terms of fundamental units , are called derived units.

100) What is SI system?
→International System of units is called SI system.
101) List the fundamental quantities in SI system.
→Length , Mass , Time , Thermodynamic temperature , Illuminating power , Luminous Intensity , Strength of electric current , Quantity of matter , Plane angle and solid angle .

102) Name any four electrical instruments and their functions.

→Voltmeter measures voltage in volts

→Ammeter measures Current in Amperes

→Wattmeter measures Power in Watts

→Ohm meter measures Resistance in ohms

103) Classify electrical measuring instruments

→Absolute Instruments

→Secondary Instruments (Indicating instruments , Recording Instruments and Integrating Instruments)

104) List the main parts of indicating instrument.

→Pointer , Pre Calibrated Scale , Moving system with spindle , Deflecting Torque ,Controlling torque and Damping Torque

105) Write the applications of Integrating instruments and Recording instruments?

→Ammeter ,Voltmeter , Wattmeter , Frequency meter , Power factor meter etc., are fall under Integrating instruments.

→The Instruments which are used in power houses and factories is called Recording Instruments.

106) What are the effects of current used in the measuring instruments?

→Magnetic effect , Hall effect and Induction effect.

107) Name different types of moving coil and moving iron instruments?

→Moving coil Instruments are a) Permanent magnetic type b) Electro dynamic type

→Moving Iron instruments are a) Attraction type c) Repulsion type

108) Define shunt and multiplier.

→Shunt is a small amount of resistance connected in parallel with ammeter. It is used to extend the range of ammeter.

→A Multiplier is a large amount of resistance connected in series with voltmeter. It is used to extend the range of voltmeter.

109) Define controlling torque.

→The force acting on a moving system , in opposite direction to deflecting torque and makes the pointer stable at its final deflected position is called controlling torque.

110) What are the advantages of moving Iron instruments?

→These Instruments can be used both on AC and DC systems.

→These Instruments are robust and free from maintenance

→It possesses high starting torque

→It can withstand momentary over loads

→It can give reasonable accuracy in the reading

111) Name different types of wattmeters and write their applications.

→Dynamometer type Instrument and Induction type Instrument

→The dynamometer type instrument can be used as Voltmeter , Ammeter and Wattmeter

→Induction type Instruments are used for 1-phase & 3-phase Induction wattmeters

112) What is damping torque?

→To minimize the vibrations of the pointer in an scale of the meter is called Damping Torque.

113) What is integrating instrument?

→Integrating Instruments which measures the electrical quantity and sum up with previous value and provides a cumulative result of electrical quantity under measurement.

114) How the energy meters can be classified?

→Digital type

→Analog type

A) Induction type(single phase and three phase)

B) Motor type (Mercury motor type and Commutator type)

115) What are the main parts of energy meter?

→Standing band , Recording mechanism , Potential coil , Break Magnet , Disc , Spindle , Current coil , Series Magnet.

116) What are the possible errors in energy meters?

→Phase error or Power factor error , Speed error , Friction error , Creeping error , Temperature error and Frequency effect.

117) Write the errors in single phase induction type energy meter.

→ Phase error or Power factor error , Speed error , Friction error , Creeping error , Temperature error and Frequency effect.

118) Write the uses of megger.

→Megger is a portable instrument used for testing the earth resistance , wiring and insulation resistance of a circuit or electrical machine or equipment.

119) What is the working principle of vibrating reed frequency meter?

→It works on the principle of mechanical resonance.

120) What is Tong Tester?

→Tong tester is an instrument which is used to check the charge condition and actual condition on high current discharge of a lead acid battery or cell.

121) Write the uses of multimeter.

→A Multimeter is a combained unit of Ampere meter, Voltmeter and Ohmmeter. It is used for measurement of AC/DC voltage , Current and Resistance. It is also known as multi-tester or AVO meter.

122) Write the uses of PF meter

→Power factor meter is used to measure the Power factor of the circuit/load.

123) What is the need of digital instruments?

→Meter reading cannot be taken quickly and accurately in analog instruments to overcome this drawback of analog instrument, digital instruments are needed.

124) Draw the block diagram of digital frequency meter.

125) What are the functions of the digital multimeter?

→Digital multimeter is a single instrument and used to measure resistance , Current(AC/DC) , Voltage(AC/DC) over a wide ranges and the output value in digital form.

126) What is Transducer?

→The function of Transducer is to convert non-electrical physical quantity(say temperature , pressure etc.,) to electrical signal.

127) What are conductors , semi conductors and insulators.

128) Classify the semiconductors.

→Intrinsic Semi conductors or Pure semi conductors

→Extrinsic or Impure semiconductors (P-Type and N-Type)

129) Name the basic types of transistors and draw their symbols.

130) Draw the symbols for a) UJT b) FET c) Zenar Diode d) BJT e) LED

131) Define transistor

→A Transistor transfers a signal from a low resistance circuit to high resistance circuit.

132) Name the different types of power supplies.

→A.C mains power supply

→Voltage stabilizer type power supply

→Voltage regulator type power supply

→Converter type power supply (AC/DC)

→Inverter type power supply (DC/AC)

→S.M.P.S (Switch mode power supply)

→U.P.S (Uninterruptable power supply)

133) Define rectifier and name different types of rectifiers.

→The conversion of A.C into D.C is called rectification. The unit employed for rectification is called rectifier.

→Types of rectifier are a) Diode valve rectifiers b) Metal rectifiers c) Solid state rectifiers

134) Define filter and list the different types of filters used in Rectifiers.

→Filter is a circuit which reduces the A.C component from the output of rectifier.

➔ A) Capacitor filter B) Choke filter C) Capacitor input filter or pi filter

135) Draw the block diagram of UPS

136) What is stabilizer? Name different types of voltage stabilizers.

→Voltage stabilizer are used to maintain a constant voltage for a common domestic appliance like refrigerator , television ,computer etc.,

→Types are 1) Zenar diode voltage stabilizer 2) Manual or non-automatic voltage stabilizer 3) Automatic voltage stabilizer and 4) Servo voltage stabilizer

137) What is Renewable Energy? Give examples of it.

→Renewable energy can be defined as energy which is obtained from natural and persistent sources of energy occurring in the immediate environment such as solar energy.

138) What is Non-renewable energy? Give examples of it.

→It is defined as energy obtained from non-renewable static sources of energy. These energy resources remain buried underground unless released by human interaction such as fossil fuels like coal , petroleum oil , natural gas and some radioactive nuclear fuels.

139) Name the six forms of renewable energy.

➔ Hydro energy , Solar power , wind energy , wave and Tidal energy , Nuclear energy and Alternative Fossil fuels.

140) What is solar energy? Write its application

→The energy produced by the sun light is called solar energy. It is used in photovoltaics to generate electricity.

141) Explain solar power system?

→A photo voltaic (PV) module is a packaged , connected assembly of photo voltaic solar cell available in different voltages.

142) What is photovoltaic cell (P.V) ?

→Photo means light and voltaic means electricity. It is a term which covers the conversion of light into electricity using semi conducting materials that exhibit the photo voltaic effect.

143) Name the types of silicon used in photovoltaics

→Mono-crystalline Silicon – also known as single – crystal silicon

→Poly-crystalline Silicon – also known as multi-crystal silicon

→Thin Film Silicon

144) Generally how many cells are needed for a solar photo voltaic panel

➔ A typical 12 volt photovoltaic solar panel gives about 18.5 to 20.8 volts peak output by using 32 or 36 individual cells connected together in series arrangement.

145) What are the methods of connecting photo voltaic cells?

→ Series and cascaded connection

146) What is solar energy equipment?

→The instalment of this equipment has the purpose of harnessing the sun's energy and converting into electricity. The components such as solar panels , inverters , racking systems and batteries.

147) Mention the types of PV systems.

→Stand alone systems

→Grid – Interactive systems

→Hybrid solar PV systems(Consumer application)