

General Interview Questions and Answers for Electrical Engineering

1. What is the Scope of Electrical Engineering?

Electrical engineering deals with study and application of electrical systems for use in different environments. It equips us with the knowledge of transmission and generation of electrical power, electrical circuit design, electronics, instrumentation, control system, understanding electrical and electronic networks etc.

The course also covers the study of electronic devices and circuits involved in measurement, instrumentation, control and protection of electrical equipments and conversion systems. Concept of computer and recent applications of computer based systems in design, analysis and efficient operation of power system, maintaining quality and security, also included in the course.

2. How can you relate power engineering with electrical engineering?

Power engineering is a sub division of electrical engineering. It deals with generation, transmission and distribution of energy in electrical form. Design of all power equipments also comes under power engineering. Power engineers may work on the design and maintenance of the power grid i.e. called on grid systems and they might work on off grid systems that are not connected to the system.

3. What is the power factor of an alternator at no load?

At no load Synchronous Impedance of the alternator is responsible for creating angle difference. So it should be zero lagging like inductor.

4. Define Reliability of power system.

Reliability: It is the capacity of the power system to serve all power demands without failure over long periods.

5. Define Demand factor, Load factor.

Demand Factor: It is defined as the ratio of actual maximum demand made by the load to the rating of the connected load.

Load Factor: It is defined as the ratio of the average power to the maximum demand.

6. Explain forward resistance, static resistance and dynamic resistance of a pn junction diode.

Forward Resistance: Resistance offered in a diode circuit, when it is forward biased, is called forward-resistance.

DC or Static Resistance: DC resistance can be explained as the ratio of the dc-voltage across the diode to the direct current flowing through it.

AC or Dynamic Resistance: It can be defined as the reciprocal of the slope of the forward characteristic of the diode. It is the resistance offered by a diode to the changing forward current.

7. Why in a three pin plug the earth pin is thicker and longer than the other pins?

It depends upon $R = \rho l/a$ where area (a) is inversely proportional to resistance (R), so if (a) increases, R decreases & if R is less the leakage current will take low resistance path so the earth pin should be thicker. It is longer because the first to make the connection and last to disconnect should be earth Pin. This assures Safety for the person who uses the electrical instrument.

8. **Why we do 2 types of earthing on transformer i.e. body earthing & neutral earthing , what is function? I am going to install a 500 kVA transformer & 380 kVA DG set what should the earthing value?**

The two types of earthing are familiar as Equipment earthing and System earthing. In Equipment earthing: body (non conducting part) of the equipment should be earthed to safe guard the human beings. System Earthing: In this neutral of the supply source (Transformer or Generator) should be grounded. With this in case of unbalanced loading neutral will not be shifted. So that unbalanced voltages will not arise. We can protect the equipment also. With size of the equipment (transformer or alternator) and selection of relying system earthing will be further classified into directly earthed, Impedance earthing, resistive (NGRs) earthing.

9. **What is the difference between MCB & MCCB, Where it can be used?**

MCB is miniature circuit breaker which is thermal operated and use for short circuit protection in small current rating circuit. MCCB (moulded case circuit breaker) and is thermal operated for over load current and magnetic operation for instant trip in short circuit condition. Under voltage and under frequency may be inbuilt. Normally it is used where normal current is more than 100A.

10. **Where the lighting arrestor should be placed in distribution lines?**

These should be placed near distribution transformers and outgoing feeders of 11kV and incoming feeder of 33kV and near power transformers in sub-stations.

11. **Define IDMT relay?**

It is an inverse definite minimum time relay. In IDMT relay its operating is inversely proportional and also a characteristic of minimum time after which this relay operates. It is inverse in the sense, the tripping time will decrease as the magnitude of fault current increase.

12. **What is the difference between Isolator and Circuit Breaker?**

Isolator is an off load device which is used for isolating the downstream circuits from upstream circuits for the reason of any maintenance on downstream circuits. it is manually operated and does not contain any solenoid unlike circuit breaker. it should not be operated while it is having load. First the load on it must be made zero and then it can safely operated. Its specification only rated current is given. But circuit breaker is on load automatic device used for breaking the circuit in case of abnormal conditions like short circuit, overload etc., it is having three specification 1 is rated current and 2 is short circuit breaking capacity and 3 is instantaneous tripping current.

13. **What is buchholz relay? What is the significance of it in to the transformer?**

Buchholz relay is a device which is used for the protection of transformer from its internal faults, it is a gas based relay. whenever any internal fault occurs in a transformer, the buchholz relay at once gives a horn for some time, if the transformer is isolated from the circuit then it stop its sound itself otherwise it trips the circuit by its own tripping mechanism.

14. **What is SF6 Circuit Breaker?**

SF6 is Sulpher hexa Flouride gas. if this gas is used as arc quenching medium in a Circuit breaker means SF6 CB.

15. **What is ferranti effect?**

Output voltage is greater than the input voltage or receiving end voltage is greater than the sending end voltage.

16. What is meant by insulation voltage in cables? Explain it?

It is the property of a cable by virtue of it can withstand the applied voltage without rupturing it is known as insulation level of the cable.

17. There are a Transformer and an induction machine. Those two have the same supply. For which device the load current will be maximum and why?

The motor has maximum load current compare to that of transformer because the motor consumes real power and the transformer is only producing the working flux and it is not consuming. Hence the load current in the transformer is because of core loss so it is minimum.

18. What happens if I connect a capacitor to a generator load?

Connecting a capacitor across a generator always improves power factor, but it will help depends up on the engine capacity of the alternator, otherwise the alternator will be over loaded due to the extra watts consumed due to the improvement on pf. Secondly, don't connect a capacitor across an alternator while it is picking up or without any other load.

19. Why synchronous generators are used for the production of electricity?

Synchronous machines have capability to work on different power factor (or say different imaginary power varying the field emf. Hence synchronous generators are used for the production of electricity.

20. What is the difference between synchronous generator & asynchronous generator?

Simple synchronous generator supplies both active and reactive power but asynchronous generator (induction generator) supplies only active power and absorbs reactive power for magnetizing. These type of generators are used in windmills.

21. What is electric traction?

Traction means using the electric power for traction system i.e. for railways, trams, trolleys etc. electric traction means use of the electricity for all these. Now a day magnetic traction is also used for bullet trains. Basically dc motors are used for electric traction systems.

22. What is the one main difference between UPS & inverter? And electrical engineering & electronics engineering?

Uninterrupted Power Supply is mainly used for short time. UPS is also two types : on line and offline . Online UPS is having high volt and ampere for long time backup with high dc voltage. UPS start with 12V dc with 7 amp but inverter starts with 12V, 24V dc to 36V dc and 120 amp to 180amp battery with long time backup.

23. Why, when birds sit on transmission lines or current wires doesn't get shock?

It is true that if birds touch the single one line (phase or neutral) they don't get electrical shock. If birds touch 2 lines than the circuit is closed and they get electrical shock. So if a human touch single one line (phase) then he doesn't get shock if he is in the air (not touching – standing on the ground if he is standing on the ground then touching the line (phase) he will get a shock because the ground on what we standing is like line (ground bed – like neutral) and in the most of electric lines the neutral is grounded. So that means that human who touch the line closes the circuit between phase and neutral.

24. What will happen if we give 220 volts dc supply to the bulb or tube light?

Bulbs [devices] for AC are designed to operate such that it offers high impedance to AC supply. Normally they have low resistance. When DC supply is applied, due to low resistance, the current through lamp would be so high that it may damage the bulb element.

25. **Which motor has high Starting Torque and Starting current DC motor, Induction motor or Synchronous motor?**

DC Series motor has high starting torque. We cannot start the Induction motor and Synchronous motors on load, but cannot start the DC series motor without load.

26. **Why human body feels Electric shock? In an Electric train during running, we did not feel any shock. Why?**

Unfortunately our body is a pretty good conductor of electricity, The golden rule is current takes the lowest resistant path if you have insulation to our feet as the circuit is not complete (wearing rubber footwear which doing some repairs is advisable as our footwear is a high resistance path not much current flows through our body).The electric train is well insulated from its electrical system.

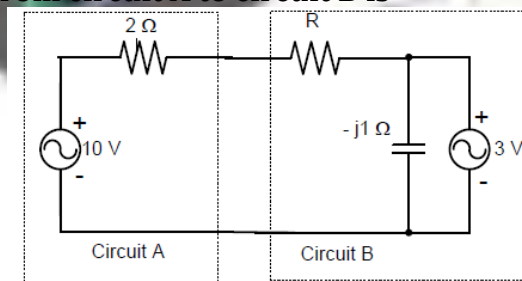
27. **How can you start-up the 40 W tube light with 230 V AC/DC without using any choke/Coil?**

It is possible by means of Electronic choke otherwise it is not possible to ionize the particles in tube light, with normal voltage.

28. **A 220 V, 15 kW, 1000 rpm shunt motor with armature resistance of 0.25Ω has a rated line current of 68 A and a rated field current of 2.2 A. The change in field flux required to obtain a speed of 1600 rpm while drawing a line current of 52.8 A and a field current of 1.8 A is**

- (A) 18.18 % increase (B) 18.18 % decrease (C) 36.36 % increase (D) 36.36 % decrease

29. **Assuming both the voltage sources are in phase, the value of R for which maximum power is transferred from circuit A to circuit B is**



- (A) 0.8 Ω (B) 1.4 Ω (C) 2 Ω (D) 2.8 Ω

30. **An analog voltmeter uses external multiplier settings. With a multiplier setting of 20 k Ω it reads 440 V and with a multiplier setting of 80 k Ω it reads 352 V. For a multiplier setting of 40k Ω the voltmeter reads**

- (A) 371 V (B) 383 V (C) 394 V (D) 406 V

31. **The locked rotor current in a 3-phase, star connected 15 kW, 4-pole, 230 V, 50 Hz induction motor at rated conditions is 50 A. Neglecting losses and magnetizing current, the approximate locked rotor line current drawn when the motor is connected to a 236 V, 57 Hz supply is**

- (A) 58.5 A (B) 45.0 A (C) 42.7 A (D) 55.6 A