

EMTI

ETO Screening Exam

A. Electrical Technology

1. Current is the rate flow of electrons under the pressure of Voltage of Supply
2. Battery is a collection of secondary cells
3. Transformer works on the principle of mutual induction
Faraday's Law of EMF induction
4. Unmoving accumulation of electrical charge is called static electricity
5. The rotor speed of 4 pole 50Hz motor will be 1500 rpm at 2% slip.
6. Power factor is the ratio of Active power to Apparent power
Power factor = $\cos \phi$
7. Change of direction of the rotation in three phase motor can be done by change the two phases
8. The alternator rotors are of salient and cylindrical type

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9. In the pure inductive AC ckt the current lags by 90° .
10. The EMF Equation for DC Gen is
- $$E = \frac{\Phi P N Z}{60 A}$$

Part two

1. What is commutation in DC generator

- It is the process in which generated alternating current in the armature winding of DC generator.
- The process of converting alternating current into direct current through commutator.

2. Explain Kirchhoff's Current Law (KCL)

- The current entering to the node is equal to the current leaving node.
- The summation of current at a node is equal to zero.

3. What is form factor of an alternator?

- Form factor the ratio of RMS value to average values.

4. What is the difference between resistance and reactance?

- Resistance is the opposition of flow of current through a conductor but reactance is

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the opposition of change in current.

5. What is the need for parallel
celling batteries.

↳ To increase the Ampere-hour
capacity of the battery.

6. What is synchroscope?

↳ It is an electrical device which
measures and displays the frequency
difference and the phase angle between
two power systems.

7. What is the Voltage and Current
relation in delta connected SM?

↳ Line Voltage is equal to phase Voltage

↳ Line Current is equal to $\sqrt{3}$ I_{ph}

8. What is a starter needed for a DC
motor?

↳ To minimize the high starting
current of the motor.

9. Explain Fleming Left Hand rule &
its application.

↳ It is a rule which is used for electric
motor which the thumb indicates force.
Forefinger indicates magnetic field &
the middle finger indicates the direction
of current.

10. What are the advantages of using
alternating current?

↳ Advantages of using alternating

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Current is used to provide for the power grid easily to change the voltage of power.

11. What is "Residual Magnetism"?
What is its role in a self-excited DC generator?

- ↳ It is the amount of magnetization left behind after removing the external magnetic field from the ckt.
- ↳ Its role

12. What are the different ways of improving power factor?

- ↳ Static Capacitor
- ↳ Synchronous Condenser
- ↳ Phase Advancer

13. What are various losses in a DC machines?

- ↳ Copper losses
- ↳ Iron or Core losses
- ↳ Mechanical losses

14. What are the advantages of transmitting power at higher voltages?

- ↳ To reduce power losses during transmission system of power.
- ↳

15. What is mutually induced EMF? Emf induced in a coil due to the

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Change of flux produced by another neighbouring coil linking to it.

B. Electronics Communication

1. Why silicon is mostly used for making the semiconductor devices?

- ↳ Can be easily oxidized
- ↳ Has higher band gap
- ↳ It has good thermal transfer of energy.

2. A silicon diodes measures a low value of resistance with the meter lead in both forward and reverse bias, which means biasing / short ckt

3. What is the essential for positive feedback in oscillator ckt?

- ↳ To building or producing oscillators

4. What are operating modes of Transistor

- ↳ Active mode
- ↳ Cut-off mode
- ↳ Saturation mode

5. Write the applications Class A and Class B amplifier ckt.

- ↳ Class A * Eliminates non-linear distortion

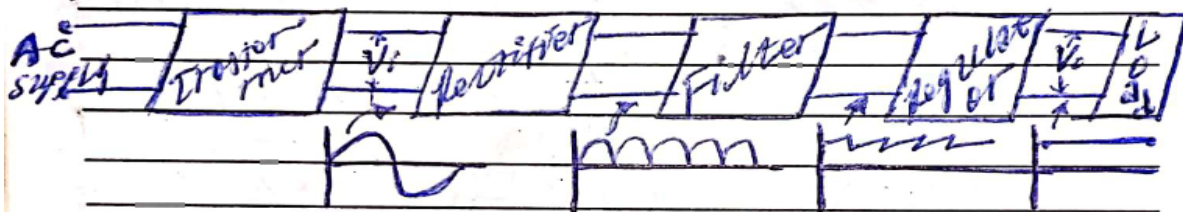
* minimize harmonic distortion

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Class B used in a cross over dis
tortion

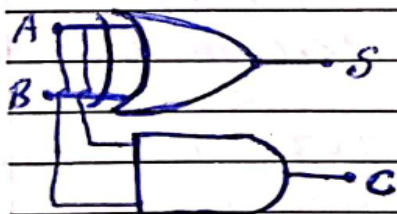
6. Explain the operation of regulated power supply unit with neat diagram



A regulated power supply can convert unregulated ac (alternating current or voltage) to a constant dc (direct current or voltage). It also used to ensure that the output remains constant even if the input changes.

7. Explain the operation of Half adder circuit with truth table

Half adder is a combinational logic circuit that accepts two inputs and a sum of output with carry.



A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

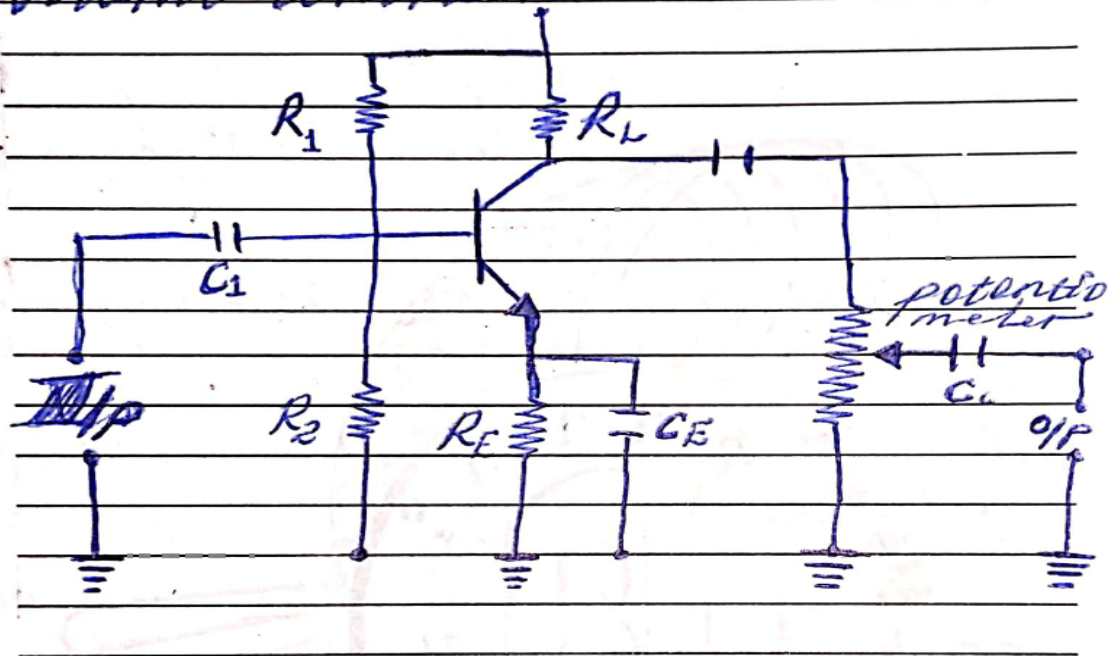
Logic circuit

Truth table

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8. Draw and explain the operation of simple Audio amplifier with volume control.



10. If the gain of the operational controller keep increasing finally it becomes digital control control.

11. Integral action is always expressed in Deviation Variables

part-2

- What is the function of a Controller?
 - maintaining a data-base containing the disclosure record of every Certifying Authority.
 - Laying down the duties of Certifying Authorities.

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- ✓ Facilitate the establishment of any electronic system.
- ✓ specifying the form and content of a digital signature Certificate and the key.
- ✓ Resolving any conflict of interests between the Certifying Authority & subscribers.
- ✓ Manage or direct the flow of data or flow information between two components.
- ✓ Allowing the software and hardware of the system to perform specific tasks.

2. What are two types of Temperature sensors?

✓ RTDs (Resistance Temp devices)

✓ Thermistors

✓ RTDs are more linear than are thermocouples. On the other hand, the thermistor has an entirely different type of const

3. What do you understand by proportional control?

✓ The controller output is proportional to the error signal, which is the difference between set point and process variable.

✓ It is the multiplication

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product of error signal and the proportional gain.

4. Write down three parts of a PLC and explain their function

i, **processor**: is the brain of PLC. It is a microcontroller which is a solid state device designed to perform wide variety of production, machine tool and process control functions.

ii, **power supply**: which converts input source power into voltage required for internal circuitry.

iii, **I/O port**: plays a critical role both in inputs and outputs protect the CPU from electrical noise.

5. Explain the function of Application layer and data link layer

↳ **Application layer**: provides services directly to user applications

* It also enables to access the network

↳ **Data Link layer**: it has three main functions

i. To deal with transmission errors.

ii. Regulate the flow of data

iii. provide well-defined interface to the network layer.