

NATIONAL BUSINESS AND TECHNICAL EXAMS. BOARD (NABTEB)
NABTEB ELECTRONIC WORKS
MAY/JUNE 2008

SECTION A

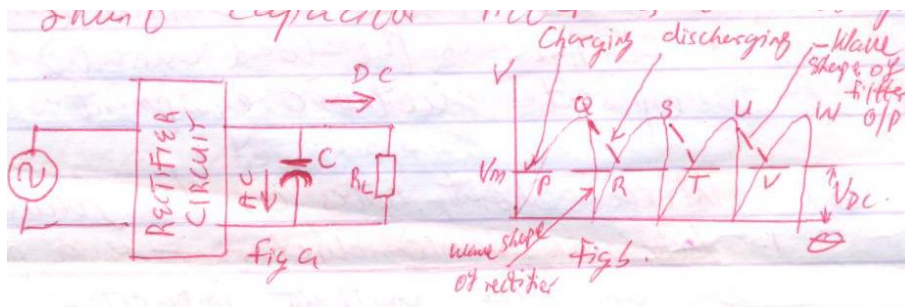
1. What is a filter circuit and how does it function?

ANSWER

i. The circuit which remove or filter an A. C. ripples from rectifier output and provide a smooth DC are know as filter circuits.

ii. **HOW IT FUNCTIONS**

Shunt Capacitor filter as a case study.



A large value electrolytic capacitor is connected in shunt (parallel) with the load R_L as shown in fig a. the capacitors allow A. C. component of the rectified output to pass through it whereas DC component go straight to the load.

The operation of the circuit is based on repeated charging and discharging of the capacitor C.

As the rectifier output voltage increases, it charges the capacitor up to point, (see fig b) the capacitor is fully charged to the peak value V_m of the rectifier voltage. Now the rectifier voltage starts decreasing as a result, the capacitor discharge through the load and the voltage across it decreases as shown by line PQ. But soon the next cycle comes, which recharges and discharges it again. The process goes on, and output from the filter circuit becomes PQRSTUUVW..... It can be seen that ripples in this filter output are very less and ripple factor has decreased.

2. Explain the function of power supplies in electromagnetic equipment.

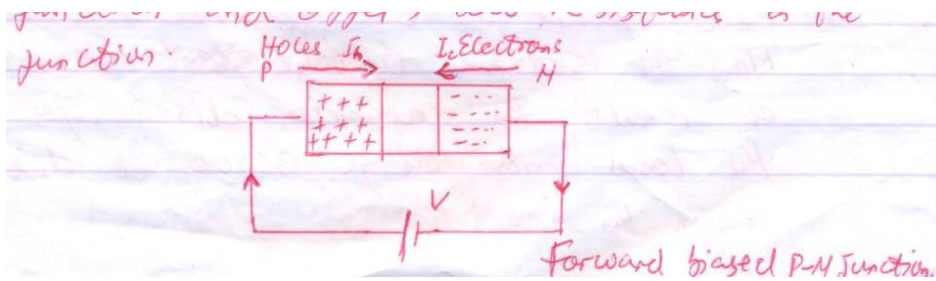
ANSWER

The power supply is a circuit that provides the require stable DC output (irrespective of changes in the load current) needed to operate electronic equipment.

3. Write short notes on the following.

- i. **Intrinsic Semiconductors:** Is a pure semi conductor without impurity.
- ii. **Extrinsic semiconductors:** Is a semi conductor in which a very small amount of impurity (doping agent) has been added.
- iii. **Doping:** The process of adding impurities to a pure semiconductor is called doping.
- iv **Forward bias:** When positive battery terminal is connected to P-region of a semiconductor and negative battery terminal to the N-region, the function is said to be biased in the forward direction.

It permits easy flow of current across the function add offer low resistance in the function.



(3) (a) What is rectification?

The process of converting A. C. power source into D. C. power source is called rectification.

The device used for rectification are called rectifies while diodes are used as rectifiers.

b. How does the characteristic of a diode help in rectification?

Diode is two terminal devices which conducts with zero resistance when forward biased, and appear as infinite resistance when reverse biased. In order word.

Diode conductors (allow current to flow through) when it is forward bias and does not conduct, when it is reverse bias. Meaning that current flows through diode in one direction and block it in the other direction. The characteristic enable it to rectify electronic signal that passes through it.

(4)

(a) What is a microphone?

Microphone is a transducer that convert sound signal into electrical signal.

(b) List FIVE typed of microphone.

- i. Capacitor (condenser) microphone.
- ii. Carbon microphone.
- iii. Moving coil microphone.
- iv. Crystal microphone.
- v. Velocity or ribbon microphone.

(c) Explain the following term in super heterodynes receiver.

- i.
- ii. **FEDELITY:** Is a measure of how well the output of a receiver reproduces the modulation of the signals received at its input.
- iii. **SELECTIVELY:** Is a measure of the ability of a receiver to reject _____ unwanted signals
- iv. **SENSITIVITY:** The sensitivity of a receiver determines the weakness signal which will provide a specified output without excessive noise.
- v. **POWER OUTPUT:** Of a receiver is usually defined as the number of watts which the audio power amplifiers can deliver to the loudspeaker.
- vi. **FREQUENCY RANGE:** Is the band of frequencies which the receiver can cover.

(5)

(a) What is the frequency range of radio waves used for the following purpose?

- (i) Broadcasting
- (ii) Long distance communication.
- (iii) Television.

ANSWER.

- i. **Broadcasting: MF** medium frequency (0.3-3)MHz
 - ii. **Long distance communication:** Beamed communication e. g. short wave comm.(3 to 30)MHz
UHF (300 to 3000) MHz
- (b) List Two imported type of modulations used in broadcasting?