# Assignment-4

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1) Explain typical AC power supply scheme in detail with neat diagram?

A) Typical AC power supply scheme:-

The large network of conductor between the power station and the consumers can be broadly divided in two parts, transmission system and distribution system each part can be furthur sub divided into two primary transmission and secondary transmission the layout a typical A.C power supply scheme by a single the diagram in shown below.

i) Generating situation:-

In generating situation represents where electric power is produced by 3-phase alternators operations in parallel the usual generator voltage is 11kv for economy in the transmission of electric power, the generation voltage (i-e, 11kv) is steped up to 132 kv (more) at the generating station with the help of a phase transformer. generally the primary transmission is carried at 66 kv, 132 kv, 320 kv, or 400 kv.

ii) primary transmission:-

The electric power at 132 kv is transmitted by 3 phase, 3-wire overhard system to the outskirts of the city this forms of the primary transmission.

(iii) Secondary transmission:-

The primary transmission line terminals at the receving station (Rs) which usually lies at outside outskirts of the city. At the receving station, the voltage is reduced to 33kv by step down transformors. from this station static power is transmitted at 33kv by 3-phase, 3 wire overhand system to various substance (ss). located at the strategic points in the city. this forms the secondary transmission.

iv) primary distribution:-

The secondary transmission line terminators at the sub-station (ss) where voltage is reduced from 33kv to 11kv, 3-phase, 3-wire. The 11kv lines run along the important road sides of the city this forms the primary distribution.

v) secondary distribution:-

The electric power from primary distribution line (11kv) is derivered to distribution substance (DS). these sub-stations are located near the consumers & localities and step down the voltage to 400v, 3-phase, 4-wire for secondary distribution. the voltage between any-two phase is 400v and between any phase and neutron is 230v. the single phase residential lighting load is Conducted between any one phase and neutral.

2) Explain the classification of Distribution system with neat diagram?

3) A distribution system may be classified according to nature of current.

According to the nature of current. the distribution system may be classified as

(a) a.c distribution system
(b) d.c distribution system.

Now-a-days a.c system is universay adopted for distribution of electric power as it is simpler and more economical than diyect current method.

Ac distribution:-

the a.c distribution system is the electrical system between the stepdown substation field by the distribution system and is electric classified into

(i) primary distribution system
(ii) secondary distribution system.

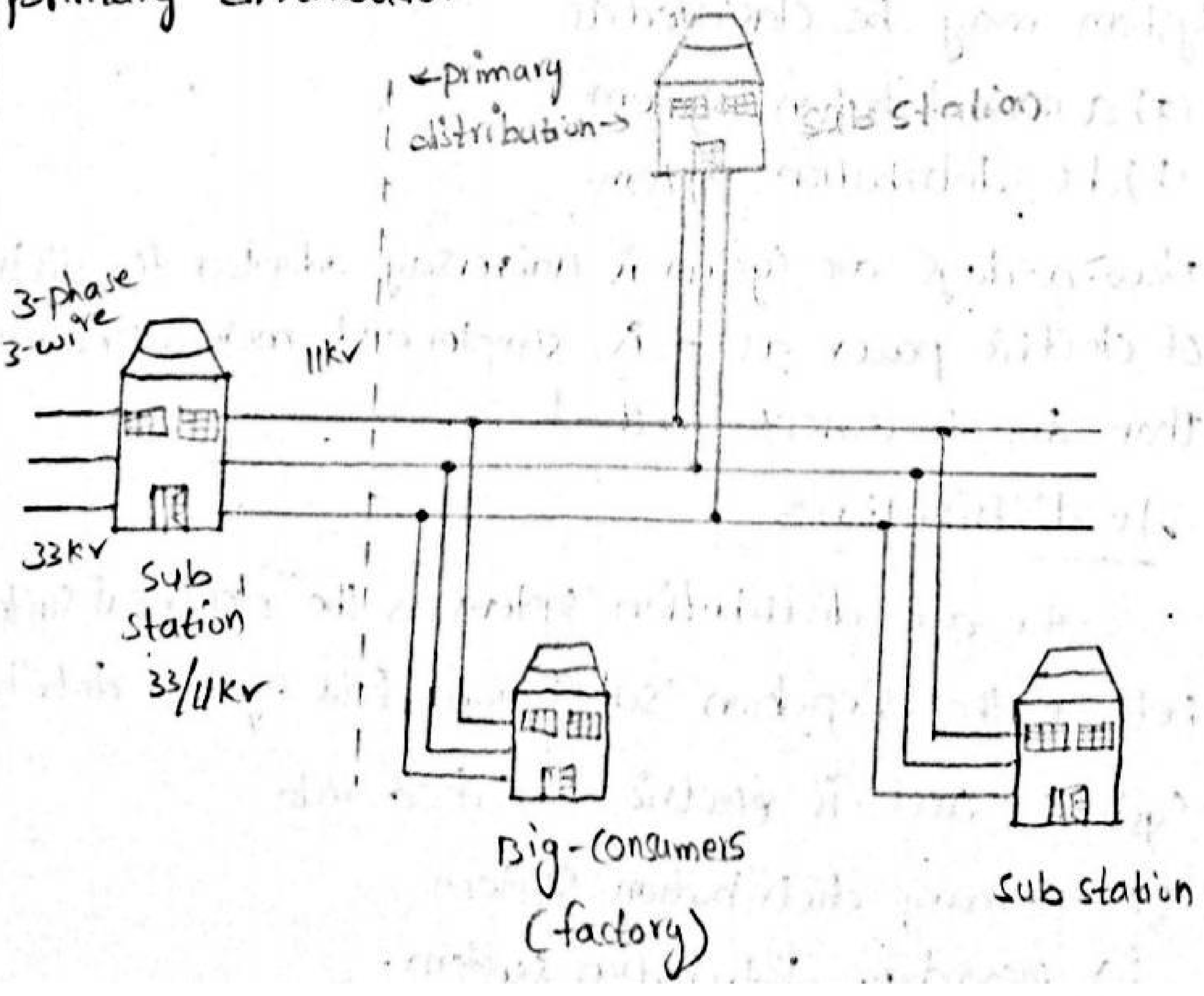
(i) primary distribution system:-

① It is that part of ac distribution system which operates at voltages some what higher than generator utilization voltages.

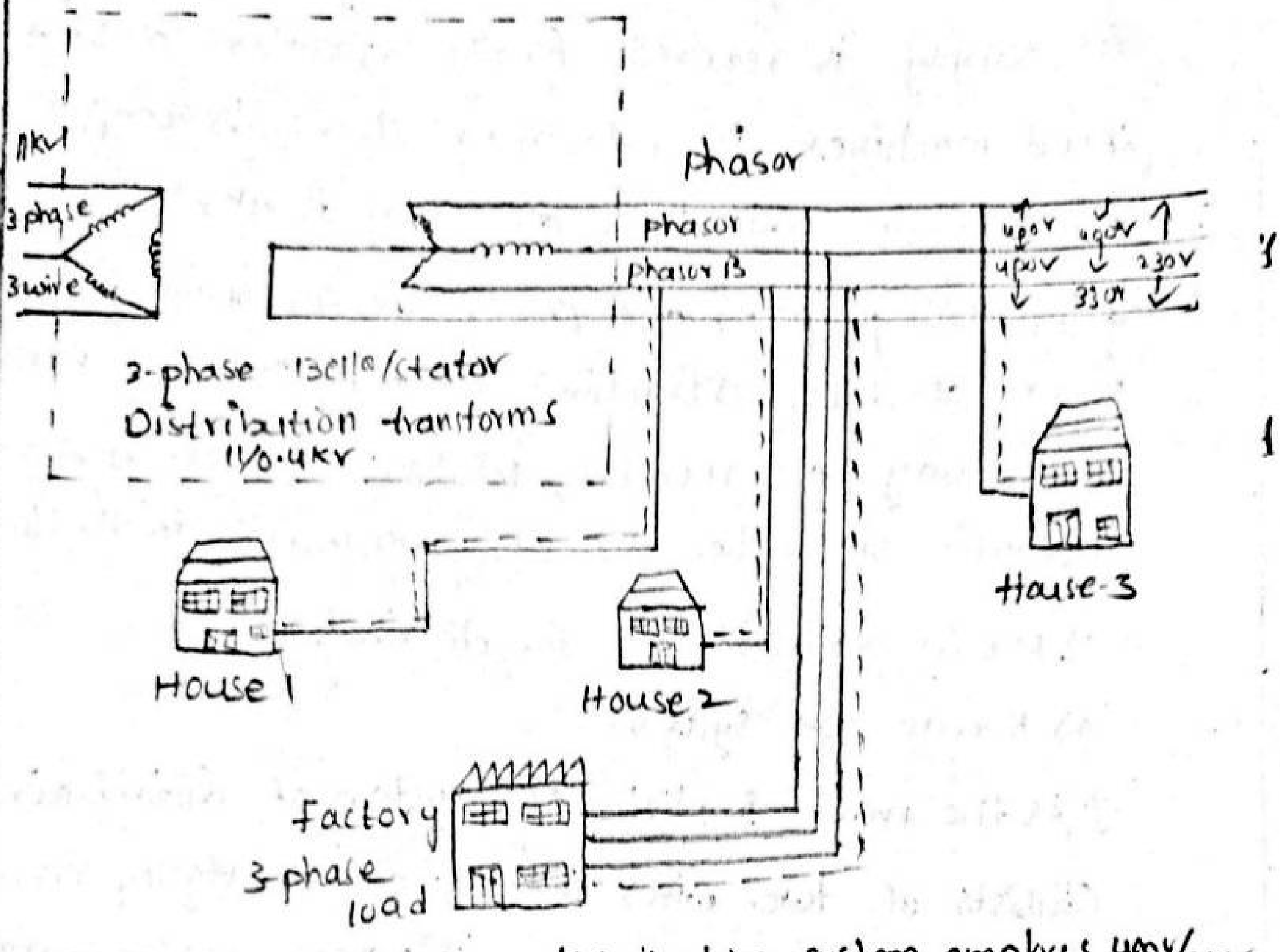
② the most commonly used primary distribution voltages are 11kv, 6.6kv and 3.3kv.

③ primary distribution is carried out by 3 phase 3-wire system.

A typical primary distribution system is shown below. Electric power from the generating station is transmitted at high voltage to the substation; voltage is stepped down to 11kv with the help of step-down transformer. power is supplied to various substations for distribution or to big consumers distribution (a) primary distribution.



## (ii) Secondary distribution system:-




It is the part of the distribution system employs 400v/230v 3-phase, 4-wire systems.

Figure shows a typical secondary distribution system the primary distribution circuit derivers power to various substations called distribution subtractions.

The subtractions are called situakd near the consumers locations and contain step down transformers.

* At each distribution subtraction, the voltage is stepped down to 400v and power is delivered by 3 phase 4-wire system
* the voltage blw only two phase is 400v and blw any phase and the neutron.

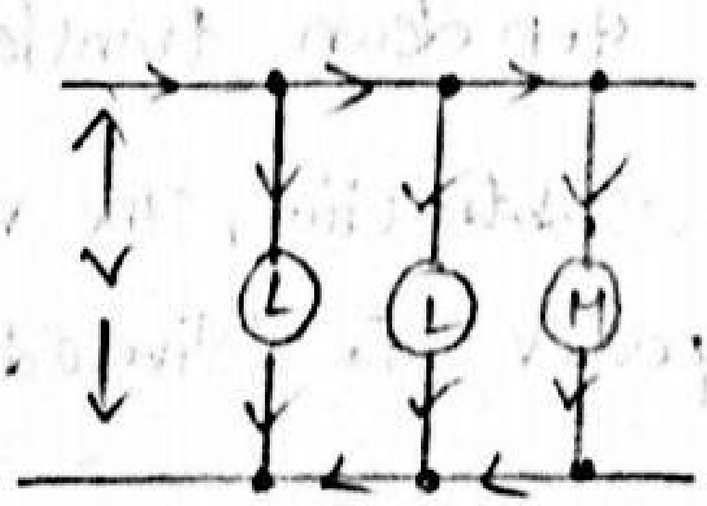
## D.C Distribution:-

* for certain applications, DC supply is absorbing necessa
d.c supply is required for the operation of variable
speed machines (ie.) d.c motors storage battery).
* for certain applications d.c supply is absolutly necessary.
* for this purpose a.c power is converted into d.c
power at the substractions by using converting machnay
eg. mercury are retiliers, rotaloy converters and motor
generator sets. The d.c supply obtained in the form of

1) R-wire (or) 3-wire for distribution.

2) R-wire D.C system:

① As the name implies. This system of distribution
consists of two wires (i) one is the outgoing (or) positive
wire and the other is the returnors negative wire.
* The loads such as lamps, motors etc are connected to
in parallel blw the two wires are shown in fig.
* This system is never and used for distribution purpose
due to low efficiency but may be employed for distri-
bution of d.c power.



## 3-wire DC system:-

* It consists of two outers and a middle or neutral wire which is emitted ourtker subtraction.
* the voltage blw the outer is turce. The voltage blw either outer and neutral.
* The principle advantage of this system is that makes available two voltages at the consumer terminals.
* voltage between any other outer and the neutral and 2-wire between the routers.
* Loads requiring high voltage (eg. motors) are connected across. The outers, where as lamps and heating in circuits requring less voltage are connected between either outer and the neutral