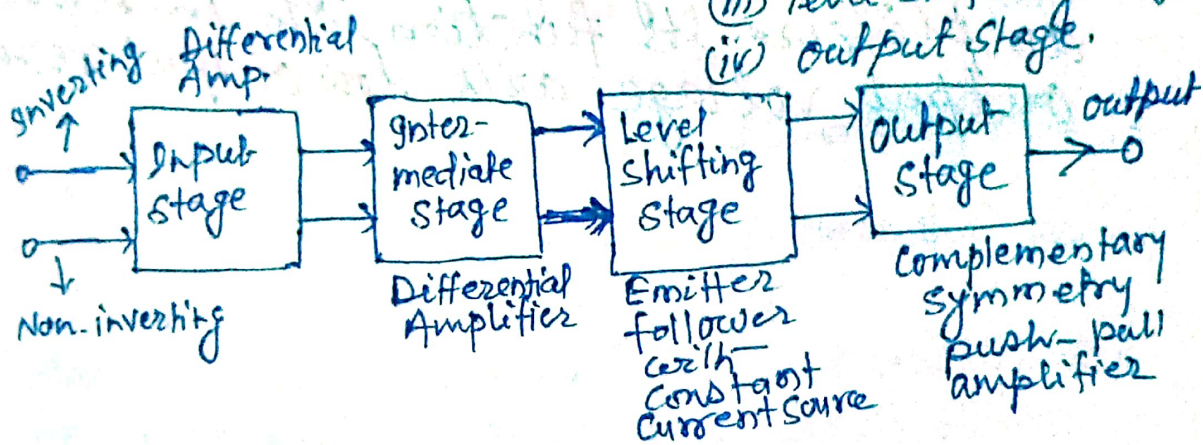


Topic: Building Block of An OP AMP

The operational amplifier is a direct-coupled high gain, negative feedback amplifier which performs mathematical operation such as summation, subtraction, integration, differentiation etc. It can amplify signals having frequency range from 0Hz (d.c) to 1MHz (A.C). So, it is called a complete amplifier.

Fig (1) shows a building block diagram of an operational Amplifier. In general, it consists of four stages -

- (i) Input stage
- (ii) Intermediate stage
- (iii) level shifting stage
- (iv) output stage.



Input stage:

The input stage is a dual-input, balanced output differential amplifier. The differential amplifier in the input stage amplifies only the difference between the input signals.

Intermediate stage:

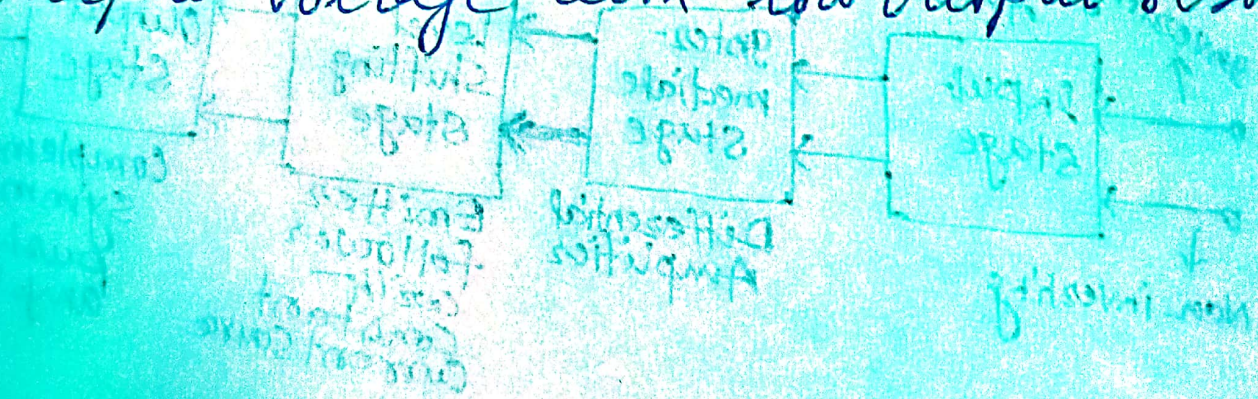
The intermediate stage is a dual input, unbalanced output differential amplifier. This is driven by the output of first stage and is used to provide some additional gain. There is a direct coupling between the first two stages which allows the operational amplifier to amplify d.c as well as A.C. signals.

(2)

Level shifting stage: Due to direct coupling, the d.c. at the output of the intermediate stage is well above the ground potential. The function of ~~shifting~~ level shifting, which is generally an emitter-follower using constant current source, is to shift the d.c. level at the output of intermediate stage downwards to zero volt with respect to ground.

Output stage:

The output stage is generally push-pull or complementary symmetry push-pull amplifier. Its function is to increase large output voltage with low output resistance.



Objective Question (3)

1. The op-amp can amplify. -----

Ans:- Both a.c and d.c. signals.

2. For an op-amp with negative feed back, the output is -----

Ans:- feed back to the inverting input

3. The input stage of an op-amp is usually a -----

Ans:- Differential amplifier.

4. An ideal op-amp draws -----

Ans:- zero current

5. An ideal op-amp ~~draws~~ has -----

Ans:- infinite gain, low input impedance high output impedance.

6. An ideal op-amp has bandwidth -----

Ans:- infinite.

7. Op-amp have become very popular in industry mainly because

Ans:- their external characteristics can be changed to suit any application.

8. An - op. AMP is a ----- IC

Ans:- linear